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An Estimate of the General Situation

For a number of years, Veterinary Medicine has attempted to give in the January issues, a sort of summary of the achievements of the profession during the year just closing—a review of what has happened during the year within the profession and what outside forces have had a determining influence upon it.

The history of the profession during the year has been largely a review and a summary of what has appeared in the pages of Veterinary Medicine. In this issue, through the kindness of the author, a different kind of summary is given in the Presidential address of Doctor Mohler before the 30th annual meeting of the U. S. Live Stock Sanitary Association.

Doctor Mohler's address is a very important contribution to the animal disease record for 1926. His sources for gathering information of this kind and the facts as to veterinary research, veterinary medicine and sanitation are equaled only by his ability to weigh and evaluate such information when it is gathered. Doctor Mohler's address will repay any veterinarian not only for a careful reading, but for a careful, detailed study of it.

Tuberculosis Eradication

The amazing progress that is being made in this country in the eradication of bovine tuberculosis invites reiterated comparison and tedious tabulation of statistics. At twenty-five of the thirty annual meetings held by the U. S. Live Stock Sanitary Association, a discussion of bovine tuberculosis has been an important part of the program. Tick fever, hog cholera, foot and mouth disease, contagious abortion and other diseases have flared into a place of predominance for a meeting or two and then interest in them has subsided somewhat, but tuberculosis has been before that association as a subject of major importance constantly since 1904.

The tuberculosis eradication project has progressed to a point where Dr. J. A. Kiernan, Chief of the Tuberculosis Eradication Division of the Bureau of Animal Industry, has compiled an estimate of the dates at which bovine tuberculosis will be reduced to less than one-half of one per cent in the various states. This estimate presumes that the congress and the various state legislatures will continue to make adequate appropriations for the support of this project and that the live stock owners and the public will continue to favor the measure. The estimates are:

Utah, New Mexico and Arizona, in 1928; Idaho, 1929; Delaware, Indiana and Wash-

ington, 1930; Iowa, Kansas and Maine, in 1931; Michigan and Pennsylvania in 1933; Minnesota and Ohio, 1934; Alabama in 1935; Florida, Kentucky and Mississippi, in 1936; Missouri, Oklahoma and Wisconsin, in 1940. No estimate was hazarded for Arkansas, California, Georgia, Illinois, Louisiana, Nevada, South Dakota, Tennessee, Texas and Wyoming.

Some statistics on tuberculosis eradication announced by Doctor Kiernan at this meeting are: 1,245 cities and towns now have ordinances requiring tuberculin testing of cows supplying milk to those cities. 804 out of 3,073 counties in the whole country, or 26 per cent, are now conducting area tuberculosis eradication work. The amount of tuberculosis found in cattle slaughtered at abattoirs where official inspection is maintained, increased steadily to 1915, when it had reached 2.6 per cent of the animals slaughtered. Since 1915, the percentage of tuberculosis in cattle slaughtered at such abattoirs has decreased steadily, reaching 1.3 per cent in 1926, or just one half of the prevalence of 1915. The amount of official testing done by practitioners who are designated as accredited veterinarians (which, by the way, does not mean that all other veterinarians are discredited) increased from 100,526 animals in 1922 to 440,581 in 1924 and to 788,995 in 1926.

Elsewhere in this issue, as a part of the summary of veterinary activities for 1926, extended extracts are given from the latest number of "Side Lights on Tuberculosis Eradication," issued by the Tuberculosis Eradication Division of the Bureau of Animal Industry. While it is, of course, realized that this material has already had a considerable distribution among those interested, its importance in detailing the progress of the project during 1926 and the light it sheds on the greater appreciation of this work on the part of the public, justifies its repetition and publication in a form more convenient for reference and more suitable for preservation.

Policy of the U. S. Live Stock Sanitary Association

The policy committee of the United States Live Stock Sanitary Association, of which Dr. T. E. Munce, State Veterinarian of Pennsylvania, is chairman, made a very brief report at the thirtieth annual meeting of this association, held in Chicago, December 1, 2 and 3, 1926.

The report calls attention to the following paragraph in the adopted policy of the association:

"This association is opposed to the use of biologics capable of reproducing disease, tuberculin and anti-hog cholera serum by persons other than veterinarians, and is further opposed to the enactment of any legislation that will legalize the use of such products by any persons other than veterinarians."

And adds:

"The experience of the middle west during the rather recent outbreak of hog cholera has given a most forceful demonstration of the sound judgment of the association in adopting this policy, and we reiterate its importance with the hope that every agency will adhere to it, as a guide in the future to safeguard the live stock industry of this country."

In the discussion it developed that this policy is not strictly adhered to in Arkansas, Kansas and Missouri, in the matter of the distribution of hog cholera virus.

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Presidential Address

Thirtieth Annual Meeting, United States Live Stock Sanitary Association, LaSalle Hotel, Chicago, December 1, 1926

Members of the Association:

Live stock sanitary authorities have been confronted constantly by important and often perplexing problems. Their responsibilities began to increase with the rapid development of the live stock industry and the expansion of transportation and marketing facilities. For many years it has been customary for such officials to discuss matters of mutual interest, especially the officials of adjacent states.

Development of Live Stock Sanitary Organizations

Frequently groups of states were represented at such meetings. A conference of more than usual significance was held at the U. S. Department of Agriculture on June 19, 1894, to consider the advisability of greater uniformity in state laws regarding infectious and contagious diseases of live stock demanding serious attention. Seventeen delegates were present, representing nine states and the Bureau of Animal Industry. At this meeting an organization was formed under the name of the National Live Stock Sanitary Association, to be composed of state live stock sanitary commissioners and their secretaries, the state veterinarians and any other state or national official having control of the diseases of live stock. It seems that this organization did not survive and again in October, 1897, the live stock sanitary officials of a number of states interested in tick fever, met at Fort Worth, Texas, with the view of arriving at some understanding, if possible, in regard to uniform regulations to control the movement of cattle from the quarantined area into, and through, the various states. The results of the deliberations at this meeting were so satisfactory that it was decided to establish a permanent organization and hold such meetings annually. The organization was named The Interstate Association of Live Stock Sanitary Boards. In 1909 a constitution and by-laws were adopted and under the constitution the name was changed to the United States Live Stock Sanitary Association.

The problems of tick fever led to the establishment of the Interstate Association of Live Stock Sanitary Boards. Its chief aim in the beginning was to bring about uniformity of action by various states in regard to tick fever; but it began early in its existence to extend its scope and usefulness. The first and second meetings were devoted almost entirely to the consideration of tick fever matters. At the third meeting, held in Chicago in 1899, bovine tuberculosis became the chief subject for discussion. Hog cholera received special attention at the fourth meeting, held in Louisville, Kentucky, in 1900. Infectious abortion, animal parasites, and anthrax were discussed with much interest at the fifth meeting, in Buffalo, in 1901, and scabies was included in the program of the following meeting. The information derived from discussions of these diseases, their nature, prevalence and distribution, had a direct bearing upon one of the purposes of our organization, namely, to suggest and guide the enactment of legislation and the promulgation of regulations toward uniformity and simplicity.

Pearson, Salmon, Dalrymple, Bolser, Austin, Peters, Johnson, Dean, and, in fact, most of the men who were responsible for the organization and existence of the Interstate Association of Live Stock Sanitary Boards and who represented their respective states so creditably in its early deliberations thirty years

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ago are no longer with us. But the organization which they conceived and founded has moved steadily forward with increasing usefulness and we look forward to these meetings each year with increasing interest. The attendance at the meetings held during the early history of the association was usually from fifteen to thirty interested persons. Now we have a membership of approximately three hundred, composed of national and state live stock sanitary officials, veterinary practitioners, municipal health authorities, representatives of transportation companies, state agricultural colleges, the live stock and agricultural press, live stock organizations and others who are interested in our problem.

The activities of this association are outstanding among those in behalf of our live stock industry. We have just cause for pride in what has been accomplished and I have great hopes for its future growth and usefulness. I deem it an honor to have been elected to act as your president during the past year—I appreciate the honor personally and in behalf of the live stock interests which I serve in my official capacity.

Only those who have had the responsibility realize how much labor is necessary in making the arrangements for a meeting of this kind. In our organization the duties are divided largely among committees and the success of a meeting depends chiefly upon the work of these committees.

Time will not permit of a detailed review of the occurrences and conditions, during the past year, which are of interest to this association, but I will refer briefly to a few of them.

Hog Cholera

One of the latest and most outstanding matters of interest was the unusual prevalence of hog cholera during the past three months. This was not an unexpected occurrence. Conditions had been shaping for several years for such an outbreak and it is fortunate, in view of the conditions which prevailed throughout the country, that the disease did not spread more and cause greater losses than it did. There had been a gradual decrease in the disease since 1914 and the outbreaks that occurred were checked by prompt immunization and the application of sanitary measures. A feeling of security grew and spread and in spite of the warnings that cholera is as dangerous and destructive as ever, hog growers gradually discontinued immunizing their herds. In many instances they felt that they could not afford the expenditure when there seemed no necessity for it. As a result it is estimated that at least 80 per cent. of the entire hog population of the country had not been immunized when in September the outbreak began to look serious.

There was suddenly a great demand for serum and serum producers were not in position to supply promptly the quantity needed. As a result of decreasing demands for several years past some producers had closed their plants, and many of those that continued to operate had reduced production and carried only small reserves. It seems certain that not more than 107,150,000 cubic centimeters of serum were on hand, September 1, 1926, and most of it had not been tested.

Realizing the seriousness of the situation, the department modified its serum-production requirements to help meet the emergency. The first step was to reduce the test period on serum from 21 to 15 days. This order was followed shortly by a further reduction of the test period to 11 days, with the hope that the emergency might be met without discontinuing entirely the tests for potency and purity. Cholera continued to spread and many farmers unable to procure serum were helpless while they watched their herds die. Reports from the field became so alarming and the representations from authoritative sources so disturbing that it was decided to suspend the tests entirely for a temporary period, as it was believed that serum carrying an element

DEC 30 1926

of risk was better than no serum. Of course supervision of the production of serum up to the testing was continued as usual. As a result of the remedial action by the department, in the neighborhood of 64,167,000 cubic centimeters of serum, or enough to treat about 1,283,000 hogs each receiving a 50 cc. dose, were released three weeks sooner than under normal conditions. The total quantity of serum released in September, 1926, was 89,996,000 cc. and for October, 1926, it was 195,018,000 cc., or a gain of 105,022,000 cc. It should be noted that of this quantity 64,167,000 cc. were obtained by suspending the test, while 40,855,000 cc. were obtained through increased production. As was expected, serum and cold weather have brought the outbreak under control. Many hogs died of the disease in some localities, but the indirect losses through shipping shotes and unfinished hogs to market have probably been as great as the direct losses. This year's experience should bring hog growers to realize that cholera is to be dreaded as much as ever and that if they neglect to keep their herds immunized they are liable at any time to suffer heavy losses.

While the individual who loses his hogs through failure to immunize them suffers most, the misfortunes of a large number of negligent individuals affect the community, or state, depending upon the extent of the losses. Therefore, it would seem advisable for all those who are interested in the welfare of the swine industry to urge immunization and all reasonable sanitary precautions to prevent a recurrence of future extensive outbreaks. Research has given the swine industry hog-cholera serum, but that does not solve the problem entirely. There must be sufficient demand for the serum to encourage its manufacture in adequate quantities. Quantity production in response to a stable demand in turn tends to bring about economical production and economy of immunization. The producers of serum should carry reasonably large reserve supplies and it would be to the advantage of all concerned if state authorities, especially in the Corn Belt, could arrange to keep on hand a reserve supply, at headquarters, to meet any such emergency as we have just experienced. Before the serum has become too old it could be exchanged, sold, or retested, and the small expense involved would be a very slight premium on the insurance covered. Similarly for the last nine years the B. A. I. has kept a supply of rinderpest serum in storage, which has been replaced with a fresh supply when necessary in order to combat any outbreak of rinderpest should it appear in this country.

Tuberculosis Eradication

In all live stock-disease-control work in the United States that has been performed since 1884 the Federal Government has assisted the various states in conquering outbreaks of an infectious or contagious nature. When the time arrived to wage a relentless campaign against animal tuberculosis, Congress provided funds for the Federal Government to cooperate with the respective commonwealths in attacking the common foe. I think it safe to say that in all the cooperative campaigns that have been conducted, the forces have never worked with greater harmony and uniformity than in this campaign now being waged. The live stock owners of the country have watched this teamwork and the success that has been obtained up to the present time, and are encouraging its continuance. This work is important not only from an economic standpoint but also because a certain percentage of human tuberculosis, especially among children, is due to infectious products of tuberculosis cows.

Time forbids a lengthy discussion of the progress that has been made in this campaign, but when it is realized that over 8,000,000 tuberculin tests were made by the cooperating forces during the fiscal year 1926, a fairly comprehensive idea is gained of the vastness of the work.

The accrediting of individual herds of

cattle is not being followed up so closely now as before, as more effort is being put into the area plan of operation.

Status of Area Work

This plan was not advocated until 1920, notwithstanding the fact that it had been tried out in the District of Columbia as early as 1908 and was found practicable.

The records show that on October 1, 1926, there were 228 counties out of the 3,706 counties which had been classified as modified accredited area, because of the fact that the disease exists to less than one-half of one per cent. In addition there were 151 counties which had completed one test of all cattle within their borders and 406 other counties were extensively engaged in area work, making a total of 785 counties or about ¼ of the total number of counties in the United States actively working on eradicating the disease.

Summarizing the work, the records show that today there are approximately 15,000,000 cattle under state and Federal supervision. There are more than 1,500,000 cattle which have been officially accredited and over 11,000,000 cattle that have passed one clean test. If from the 60,000,000 cattle in the country we subtract 7,000,000 calves of the 13,000,000 under one year and also the 7,000,000 steers, we would find that one-third of the remaining cattle are now under supervision. There had been condemned and destroyed for tuberculosis from the inception of the work, in 1917, over 1,000,000 cattle and during the same period more than 29,000,000 tuberculin tests had been applied to cattle. The last Congress gave the Bureau an appropriation of $4,653,000 for tuberculosis or an increase of $1,093,000 over the previous year, and made $750,000 immediately available for indemnities. This increase was due largely to the excellent work of your committee on legislation in Washington last February.

The demand at this time on the part of the live stock owners to place their herds under supervision is greater than ever before and the prospects of continued progress seem satisfactory.

Tuberculin

During the year the biochemical studies of tuberculin, which have been under way in the laboratories of the Bureau for some time, have led to a number of interesting observations. Perhaps the most important of these has been the determination of the fact that the active material of tuberculin, contrary to the general belief, is absorbed by a number of different substances, such as finely divided charcoal, Fuller's earth and diatomaceous earth, commonly called "kieselguhr." As the Berkefeld filter, which is so generally used to remove bacteria from tuberculin and from other biological products, is composed of kieselguhr, this observation, aside from its scientific interest, may be of great practical importance, since such a filter no doubt removes part of the active material from the tuberculin. All of the substances named above carry a negative electric charge. Finely divided calcium carbonate, which carries a positive electric charge, does not seem to absorb the active material. A preliminary statement of these findings is contained in the forthcoming December number of the Journal of the American Veterinary Medical Association.

Tuberculosis Cures and Immunizing Agents

It is a function of the Bureau of Animal Industry to keep itself informed on the claims made from time to time regarding alleged tuberculosis cures and immunizing agents. Such claims, with few exceptions, can be dismissed as invalid after a brief analysis of the evidence of which they are based. Among the exceptions three are of comparatively recent date. They are the defatted tubercle bacillus of Dreyer, the sanocrysin or gold-salt treatment of Mollgaard, and the B. C. G. vaccine of Calmette and Guerin.

Dr. Georges Dreyer, Chief of the Department of Pathology of Oxford Univer-

sity, England, assumed that the specific proteins of the tubercle bacillus are prevented from leaving its body by the fatty envelope in which they are inclosed in sufficient amounts to cause immunity in infected organisms, and, therefore, that the tubercle bacillus, after the removal of the fatty material, would be serviceable in the treatment and prevention of tuberculosis. The results he obtained in testing his assumption could not be confirmed by the Bureau. Tubercle bacilli defatted in strict accordance with the method he described failed to cure or prevent tuberculosis in small experimental animals. In passing, it may be recalled that Dr. Dreyer is only one among truly meritorious investigators whose conclusions on the specific treatment and prevention of tuberculosis have proved untenable.

The Mollgaard, or sanocrysin, or gold-salt treatment requires successive injections of a solution of the gold-salt into the veins of the tuberculous subject, followed, if albumin appears in the urine, by injections of a serum obtained from the blood of animals previously injected with killed tubercle bacilli.

As the claims of Mollgaard were based largely on experiments with calves, their validity was tested in an experiment with calves, planned by the Hygienic Laboratory of the U. S. Public Health Service, in which the Bureau, the Rockefeller Institute for Medical Research and the Research Laboratories of the New York City Health Department cooperated.

In the experiment the treatment proved fatally dangerous for artificially infected tuberculous calves. The tubercle bacilli in the bodies of the calves, contrary to the claims that they would be disintegrated, remained visibly unaffected and retained their pathogenic potency. The reactions following the injection of the gold-salt into healthy and tuberculous calves were alike. The most favorable conclusion that could be drawn from the experiment and other available data is as follows: If sanocrysin has any value in the treatment of tuberculosis it remains for the future to prove it and to determine how the dangers incident to its use can be eliminated.

It may be added that salts of gold and other heavy metals have long been studied relative to their value in the treatment of tuberculosis, and that, as the Journal of the American Medical Association (Jan. 24, 1925), pointed out in an editorial, sanocrysin is not a newly discovered salt of gold.

The B. C. G. vaccine of Calmette and Guerin is alleged to be an originally virulent strain of the bovine type of the tubercle bacillus, the pathogenic potency of which disappeared under long continued, artificial cultivation on a culture medium containing bile, and which induces a high degree of resistance against tuberculosis in animals whose bodies, prior to vaccination, have not been invaded by virulent tubercle bacilli.

In addition to the use of the vaccine to protect the children of tuberculous families, Doctors Calmette and Guerin are striving to secure the vaccination of all calves in France as early as possible after they are born, and seem to believe, if they are successful in this, that it will gradually eradicate tuberculosis from the cattle of France.

Children are given the vaccine per mouth, three doses, on alternate days, during the first week to ten days of their lives. The calves receive the vaccine either subcutaneously or intravenously, preferably subcutaneously in the region of the dewlap.

Calmette and Guerin plainly state that the vaccine is not a curative agent for tuberculosis, and that good from it cannot be expected if its use is delayed until after tubercle bacilli have entered the bodies of the children or calves.

The Bureau has been studying the vaccine for some time. The results it has so far obtained indicate that vaccinated calves, on receiving intravenous injections of virulent, bovine tubercle bacilli, are somewhat more resistant, but by no means wholly immune, against tubercu-

losis than control or unvaccinated calves.

Without at all condemning the B. C. G. vaccine, probably the best thing to do until the many tests to which it is being subjected have supplied data for reliable conclusions, is to follow the lead of the National Tuberculosis Association, which approved a resolution at its annual meeting last October worded about as follows:

"There is no specific cure for tuberculosis such as antitoxin for diphtheria and no specific preventive such as vaccination against smallpox."

Paratuberculosis

Most of you are familiar with the disease of cattle known as Johne's disease, paratuberculosis, or infectious bacterial enteritis of cattle, and know something of its characteristics; however, some may not be aware of its insidious character, its increasing prevalence and the need for regulatory measures to cope with the disease as it now exists.

This malady is an infectious diarrhea and when prevalent in a herd of cattle offers a serious handicap, for it not only renders dairy animals unproductive, but the disease is contagious for the other members of the herd, and is moreover fatal to the animals, usually after running a more or less chronic course, despite the best of care that can be bestowed on the victims. The incubation period, may be very prolonged, perhaps many months, so that during this interval other animals coming in contact may pick up the infection from contaminated pastures or fodder. In other words, the disease acts in many ways like intestinal tuberculosis and on account of this, diagnostic methods have to be applied that are quite analogous to some of those that are carried out for tuberculosis. A biological test known as the Johne's test, quite similar to the tuberculin test, is used for making a diagnosis.

The Bureau, while cognizant of the presence of the disease in limited sections of 8 or 9 states, has failed heretofore in securing funds that could be used in an effective manner to combat the disease. However, I am happy to inform you that Secretary Jardine and the Bureau of the Budget have approved the inclusion of paratuberculosis in the tuberculosis-eradication item. This means that, if the Congress approves, the disease will be attacked along lines similar to the tuberculosis campaign, even to indemnifying the owners of condemned and slaughtered cattle.

It is hoped that the sanitary officials of infected states will be able and willing to fight this disease before it has become more widespread, but on account of our inability to increase incubator space the diagnostic agent, Johnin, to be used by the various states must be obtained from state experiment stations or biological houses. The present demand for tuberculin for use on cattle is overloading our capacity on account of our limited space and therefore neither avian tuberculin or Johnin can be prepared for our cooperating forces.

Tick Eradication

The cooperative efforts, participated in by cattle owners, state and county officials, and the Bureau of Animal Industry, to exterminate the cattle tick in the infected sections of the South, have now been in progress for 20 years and have resulted in the release of 72 per cent of the original quarantined area.

At the inception of the fight on this disease-carrying parasite in 1906, 15 Southern and Southwestern States were in whole or in part under the tick embargo. In this quarantined territory there were 984 counties, with a total area in excess of 728,000 square miles. Of these counties 737 have been released and of these released counties 641 are entirely tick-free.

A review of these figures might give the impression that the feasibility of this project has been so definitely demonstrated that it is now but a simple mathematical problem to estimate quite accurately when tick eradication in the

United States will be an accomplished fact. Unfortunately, this is not the case. There are still a few localities where indifference or active opposition continues, and in two states, Mississippi and Louisiana, there was an actual loss of ground during the past year. It will therefore be apparent that the time required to completely free the cattle industry of the South from this destructive pest will depend largely upon how soon these sections decide that they want to finish the job. It is no longer a question of how to eradicate the cattle tick; the important and controlling phase of this work now is the thorough and conscientious cooperation of the cattle owners and local officials.

This year, largely through the forceful efforts of your tick eradication committee, the inconsistent provision in the Act of Congress of 1884, which provided that splenetic or Texas fever should not be considered a contagious, infectious or communicable disease and authorized the interstate shipment of ticky cattle for immediate slaughter without dipping, was repealed. This amendment, which undoubtedly will have an important effect in stimulating the completion of this project, was approved June 28, 1926. It provides, however, that until May 1, 1928, cattle infested with or exposed to cattle fever ticks may be shipped in interstate commerce for immediate slaughter after one dipping in accordance with such regulations as the Secretary of Agriculture may prescribe. After that date cattle must be free from ticks before they will be eligible for interstate shipment for any purpose.

Foot-and-Mouth Disease

The recent outbreaks of foot-and-mouth disease in Texas and California have been stamped out and the United States is again entirely free from this intensely infectious malady. The last diseased herd in the former state was destroyed on October 15, 1925. The testing of infected premises was completed in March, 1926, and on April 1 all quarantine restrictions on Texas were revoked. In California where infection in deer in the Stanislaus National Forest presented a most difficult problem the last deer showing recent lesions was taken on June 10, 1925. The infected ranges were tested by the grazing of cattle on them during the latter part of the 1925 grazing season and of the present season with negative results. All quarantine restrictions were removed from the state on June 10, 1926.

Conditions in nearby countries, however, so far as this disease is concerned, are not so favorable. In Jamaica where they have been having trouble at intervals for several years, there was a recurrence in June, 1926, after apparent freedom since July, 1925. This outbreak has been confined to a small area and is being vigorously combated by the Jamaican authorities who are using the slaughter method.

A most menacing situation confronts this country in our neighboring Republic of Mexico where an outbreak of foot-and-mouth disease was officially confirmed early in May of this year. Two veterinary inspectors were sent from this country to the affected section upon request of the Mexican authorities to assist in diagnosing the trouble and in making a survey to determine the extent of the outbreak. The disease has appeared in the states of Tabasco, Yucatan, Campeché, and Cheapés. The infected territory is an isolated one with only the most primitive means of communication with other parts of Mexico except by steamer between gulf coast ports. The Mexican authorities have been endeavoring to eradicate the disease. They apparently have it under control but new outbreaks still occur occasionally in the infected area.

As soon as it was known that the disease existed in Mexico the Bureau issued an order prohibiting the importation of specified kinds of livestock and materials from that portion of the country lying south and east of the Tehaunte-

pec National Railway and instructed its inspectors at gulf coast ports to visit incoming vessels from Mexico to insure strict enforcement of this order. A somewhat similar embargo was placed on shipments originating in Jamaica when the outbreak occurred in that island.

Designed to afford the livestock interests of this country greater protection against foreign animal diseases, the Bureau issued an order effective July 1, 1926, prohibiting any vessel entering a port of the United States which has on board as ship stores cattle, sheep, other ruminants or swine originating in a region in which foot-and-mouth disease or rinderpest exists, and another requiring the disinfection of previously used bags and bagging material imported from such countries; also an order effective January 1, 1927, placing an embargo on fresh and frozen beef, veal, mutton, lamb or pork originating in any regions in which either of these diseases exists.

Owing to the close geographical relationship between Mexico and the United States and reciprocal interests in matters of commerce including exchange of live stock and other agricultural products, an outbreak of a dangerous foreign animal disease in one country is a matter of concern to the other. Following an exchange of notes between the two governments concerning the desirability of applying common measures of defense against invasion of such diseases, delegates representing the two countries were appointed to consider this matter.

These delegates met in Washington in July of this year and after discussing the subject in all its aspects prepared a joint report of decisions and recommendations for submission to their respective governments. This report is in the form of a treaty which requires ratification by the Senate of Mexico and of this country before its provisions will become effective.

Congress in the Second Deficiency Act of March 4, 1925, appropriated $75,000 for the study of foot-and-mouth disease in Europe which led to the appointment of a commission by the U. S. Department of Agriculture for this purpose. This commission consisted of three members, one of whom was from the Rockefeller Institute for Medical Research, one from the University of California, and the third being a representative of the Bureau.

The commission left the United States in May, 1925, and returned in July, 1926. France, Germany, England, Denmark, Sweden, Holland, Belgium, Switzerland, Austria, Hungary and Italy were visited where a study was made of the research work being done and the control measures employed in combating this disease. The commission established itself at the Institut d'Hygiene et de Bacteriologie, Strasbourg, France, and later also at the Laboratorie National de Recherches, Alfort, France, where experimental work was done on certain problems of the disease. While the time for experimental work was relatively short due to the lapse of the appropriation, a considerable amount of valuable information relative to the various phases of foot-and-mouth disease was obtained, and though neither the causative agent of the disease was cultivated nor a specific vaccine discovered, certain contributions extending the outposts of our knowledge of foot-and-mouth disease resulted.

Laboratory studies on the virus have thrown further light on its nature and the conditions favorable to its artificial cultivation, while a study of the action of disinfectants on the virus brought out some new points of interest. The plurality of foot-and-mouth disease virus as a disputed point was settled by the commission in confirmation of the work of Vallée. This has also since been confirmed by the British foot-and-mouth disease research committee, and Professor Waldmann of Reims, Germany, who had previously denied the existence of such plurality.

Comparative studies on vesicular stomatitis and foot-and-mouth disease occupied a large part of the work of the commission and as a result comparative

knowledge of the two diseases has been greatly increased.

Particular information on the infectivity period of infected animals and the spread of the disease has been obtained, while a general study of the epidemiology of the disease in the various European countries has given information that should be of practical value to the United States in dealing with future outbreaks of foot-and-mouth disease.

Vesicular Stomatitis

Vesicular stomatitis has been reported from five states during the current year. A factor of great importance in connection with this disease is that its lesions are so much like those of foot-and-mouth disease that it is extremely difficult to differentiate them. A precise and rapid method of distinguishing the one disease from the other is much needed and the discovery of any facts that can be used to improve our present method will be welcomed.

While recent work of the bureau has added quite a little to our knowledge, it has not as yet, unfortunately, revealed greater differences in the nature and manifestations of the two diseases than were already known. In fact, the reverse is true; because certain supposed differences have been found not to exist.

It has been proved that vesicular-stomatitis virus behaves practically the same towards guinea pigs as European investigators, a few years ago, proved foot-and-mouth to do. It has also been found, contrary to earlier belief, that the virus of vesicular stomatitis is a filter passer. It was hoped that the guinea pig and filter would be of some value in helping to distinguish between the two diseases, but we know now that unless minor differences in the behavior of the two viruses towards the guinea pig and filter are discovered, they are of no value for this purpose.

Earlier observations indicated that vesicular stomatitis did not affect the feet of cattle or horses, but recent observations and experiments have shown that the feet of cattle are occasionally affected in naturally acquired disease and may show marked lesions indistinguishable from those of foot-and-mouth disease, and that feet lesions are sometimes produced both in cattle and horses by intravenous injections of the virus. As in foot-and-mouth disease the virus has been demonstrated to be present in the blood in the earlier stages.

The disease is unlike foot-and-mouth disease in that it is usually only mildly contagious since close contact with infected animals in the early stages of the disease, or with the freshly infected environment of such animals seems necessary to infect. In a recent outbreak, however, the infection was much more virulent than usual and once introduced rapidly spread through a herd and seemed to be carried from herd to herd by other means than the movement of infected cattle. Small vesicles on the teats of cows have been observed in previous outbreaks, but in the one above mentioned, teat lesions of large size developed in a large proportion of cows in two dairy herds. Milking was rendered extremely difficult if not impossible, and the disease has probably caused permanent, severe damage to the udders of many of the cows.

Work now in progress with material collected from the above outbreak and from a former outbreak in a widely different section of the country, indicates that there are at least two distinct strains of virus neither of which will immunize against the other, though one of them has been proved to give a definite and fairly lasting immunity against itself.

Of animal inoculations so far undertaken, those of horses and mules are the only ones found to be reliable in differentiating vesicular stomatitis from foot-and-mouth disease. Though some European investigators have reported that horses sometimes contract foot-and-mouth disease, no indications of it have been observed in these animals in the several outbreaks of the disease that we

have had in this country though many horses have been exposed by close association with diseased cattle and a number by artificial inoculation. Both horses and mules, however, contract vesicular stomatitis with great regularity of inoculation. The disease becomes manifest by the formation of well-developed vesicles within 48 hours. Therefore, until some better method is found, the inoculation of horses or mules must be our main dependence in our efforts to distinguish vesicular stomatitis from foot-to-mouth disease.

Parasites of Live Stock

For eight years the bureau has endeavored to secure funds to finance investigations of parasitic diseases of live stock in our Southern States, but thus far it has been impossible to secure them. For years we have known that various parasites caused serious losses among southern live stock from time to time, but our knowledge of conditions in the south has been very sketchy and inadequate.

Convinced that this southern work must be done without additional appropriations, we have discontinued several northern projects which had carried their work to the point of developing measures of proved value in parasite control and have transferred these projects to the south. One of them is the control of swine parasites, a project which had developed the highly successful system of swine sanitation in McLean County, Illinois. This project has been transferred to Moultrie, Georgia, where it is now being carried out under very good conditions as regards cooperation and the opportunity to consider not only ascarids, the worms receiving attention in McLean County, but also kidney worms and other parasites prevalent in the south. The sheep projects previously conducted at Vienna, Virginia, and Queen City, Missouri, have been closed and experiments begun at McNeill, Mississippi. This work has already given interesting results in demonstrating the grave dangers in overstocking pastures of Bermuda grass, carpet grass and lespedeza. The subject of cattle parasites has received little attention in this country in the past and a new project dealing with this subject has been started on the experiment station at Jeanerette, Louisiana, with funds from the appropriation from that station.

With these three stations investigating parasites of swine, sheep and cattle, respectively, we shall undoubtedly know much more about the prevalence and importance of these parasites and of the possibilities of control in the next few years than we do at present.

Bovine Infectious Abortion

Bovine infectious abortion, the economic importance of which must be ranked as nearly if not actually supreme among the infectious diseases of domestic animals, continues to present unsolved problems. Utilization of the knowledge at present available often enables the prudent stock owner to maintain an abortion-free herd. Even the eradication of the disease from infected herds is not a hopeless undertaking. Sanitary control measures, based on our present knowledge of the disease, have given satisfactory results. But it must be kept in mind that sanitary control measures, directed against a widespread, common and insidious disease that produces many, apparently unaffected carriers and disseminators of its causative agent, necessarily must be complex and somewhat laborious and expensive, and that they must be continued, uninterrupted and free from mistakes, for long periods of time. Hence, as mistakes are easily made, especially when important tasks must be entrusted largely to laymen, we cannot fail to appreciate that something simpler and less apt to be burdened with disappointments is eminently desirable. For this reason investigations still in progress on specific immunization against bovine infectious abortion should be encouraged.

It may be that some good will come out of tests now being made with cultur-

13
DEC 30 1926

ally attenuated strains of the abortion bacillus, or with the use of strains derived from swine to immunize cattle and strains from cattle to immunize swine. Culturally attenuated abortion germs are easily obtained, and preliminary experiments indicate that abortion germs from cattle and swine, though infectious under natural conditions for the species from which they were derived, are virtually lacking in infectivity for the other species.

Data are gradually accumulating to show that infectious abortion causes probably greater losses than past estimates would lead us to believe, because it now seems that dairy cattle which react with serological abortion tests produce less milk and butterfat than similar cattle which do not react. From the economic standpoint this is a very important matter in its relationship to the use of living-culture, abortion vaccines, because the injection of such vaccines engenders reactivity to serological tests.

All abortions and breeding troubles among cattle are not due to the germ of bovine infectious abortion. The undeniable part played by deficiencies in the feed of cattle is receiving much attention, but in this connection it is well to remember that it has been proved over and over again that the bacillus of Bang, unaided by other discoverable causes, is the most important factor in bovine abortions.

Increasing attention is being given to the possible significance of the Bang bacillus for public health, because of the remarkable resemblance between it and the germ of Malta or undulant fever. Relative to this phase of the subject it may be said, though it is a wise policy to avoid the unnecessary exposure of human health to germs pathogenic for any species of animals, it does not seem that the abortion bacillus either is or is apt to become an important public health factor if we take into account the enormous number of persons in America and Europe who have been exposed to it without consequent, recognizable sickness, and the large proportion of persons who contract Malta fever from the ingestion of raw milk from infected goats.

Bacillary White Diarrhea

As regards the "billion dollar" poultry industry of the United States, no disease problem is of greater moment than bacillary white diarrhea. This malady, like contagious abortion of cattle, strikes a deadly blow at the very fountain head of the industry's young life.

The bureau is by no means indifferent to the menacing character of this disease, but on the contrary, is in full sympathy with the present impulse of the poultryman to grapple with so destructive a foe. We cannot escape the impression, however, that the action inspired by that impulse thus far, has to a degree lacked certain qualities that seem essential to lasting results. In some quarters there has been a tendency toward the premature application of ideas yet unproved. It would seem high time that we pause for a deliberate survey of the situation, and a dispassionate inquiry into the feasible ways and means of the most effectual plan of attack.

As the matter now stands, any participation of the bureau in a comprehensive campaign against bacillary white diarrhea must be limited to an advisory or supervisory capacity. In fact, several prerequisites appear to be imperative before we could hope to function adequately even to that limited extent. One of the conditions referred to is the necessity of a better unified organization of the state agencies cooperating in the plan in question. Complex or conflicting state machinery would unquestionably impede the best interests of joint action on the part of state and Federal governments. Therefore the state arm of the movement should be singled down to one official branch, whether that be the live stock sanitary board, state college of agriculture, state veterinarian, or office of marketing, as the case might be. That branch should be responsible for the application of the agglutination test for bacillary white

diarrhea, and its interpretation. Field and laboratory forces and equipment necessary to the plan of flock recognition subject to test would doubtless be dependent upon private or state funds for support, as no appropriations are now available for sustaining this routine work as an activity of the Federal government.

There are probably almost as many versions of the test extant as there are laboratories conducting it, thus establishing a state of chaos out of which some uniformly sound basis of recognition must be developed. Added to this disorder is the fact that many strains of the white-diarrhea germ are low or lacking in agglutinative properties, and if used in antigens would be certain to yield confusing results, if not eventually to afford a false sense of security to many owners of dangerously infected flocks.

Our plea, therefore, should be for a standardized test, definitely worked out with known standardized antigens to the accomplishment of definite, dependable results. Qualified veterinarians, interested in poultry diseases and inclined toward serological work, could readily conduct agglutination tests after appropriate instruction and our colleges should be in position to furnish such instruction to graduate veterinarians desiring it. Obviously after acquiring the technic of making these tests for one disease, it may be easily applied to other diseases such as infectious abortion, the control of which in my opinion will continue for years to come in the hands of the practitioner working on each animal as a unit. Standardized antigens for these tests should be made available by biological houses or state experiment stations. I have asked your committee on poultry diseases to further cultivate this topic as well as a systematic method of handling avian tuberculosis, and I anticipate with confidence the wisdom of the conclusions to be presented at this meeting.

Disinfectants

There is no question but that disinfection as carried out at present, is on a largely empirical basis and yet it is known that many disinfectants are quite specific in their action, being capable of destroying one disease-producing organism without having much power against another. Our laboratories have been endeavoring to attack this problem from the standpoint of bactericidal efficiency in relation to chemical constitution and the work has progressed far enough to show that the two things are very definitely related, at least in certain series of chemical compounds, such as the phenols. It has been possible in the laboratories to prepare substances which have never been made before by chemists and in advance to predict very accurately the bactericidal power which they would possess. These researches have led to the development of certain compounds which have an enormously high bactericidal efficiency. One in particular has been found when tested under laboratory conditions against staphylococcus aureus to be 1,000 times as powerful as carbolic acid, weight for weight. We look forward with much interest to the development of these researches.

Important Supreme Court Decision

Last March the United States Supreme Court, in the case of Oregon-Washington R. R. & Navigation Company v. State of Washington, rendered a decision holding as invalid a state quarantine against the introduction of a serious plant insect, on the ground that by the Federal plant quarantine act Congress had itself assumed such authority. Thereupon Congress amended its plant quarantine law so as to authorize the states to establish and enforce quarantines for plant diseases until the Federal government should establish similar quarantines. Believing that the courts would render a like decision should the point be raised in a contested case involving a state animal disease quarantine, the bureau has already recommended that Congress enact at the coming session a similar amendment to

our animal quarantine laws. This measure should receive your earnest support and the immediate attention of your committee on legislation.

General Statements

In conclusion I wish to leave with you as the main theme of my address the desirability of laying stress on continuous, persistent, and systematic effort. Much energy is wasted by starting meritorious activities and then, after the first period of enthusiasm, losing interest. This tendency applies to scientific work, administrative work, and even regulatory work. The real test of ability among individuals and in an organization is not so much in conceiving and undertaking work as in preserving the initial enthusiasm until the job is finished. Now that most of the work of the association is progressing satisfactorily, this is an opportune time to pursue some of the unfinished work and settle some of the more controversial and doubtful points by conclusive study and reports.

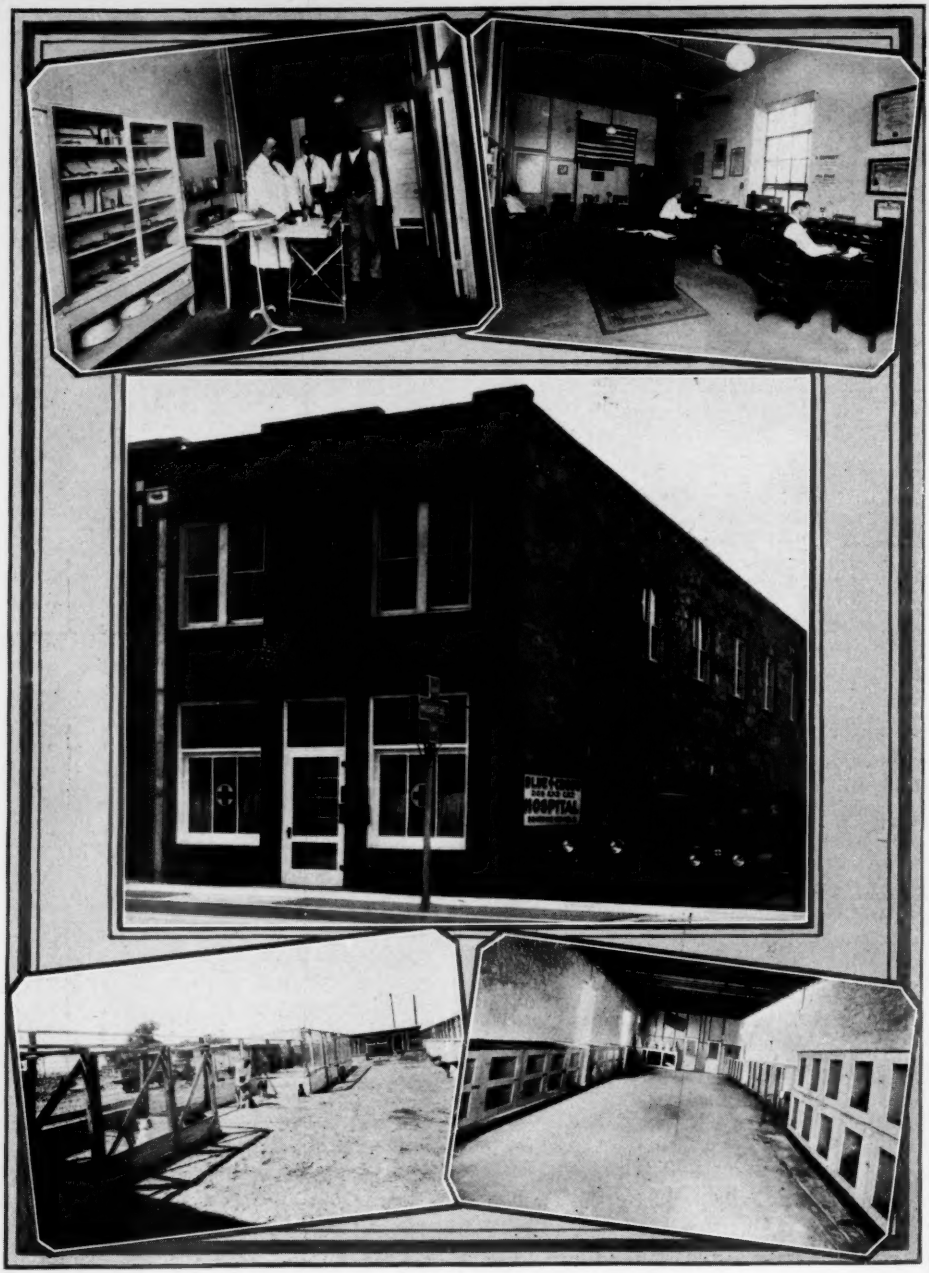
I also wish to suggest the advisability of establishing wider and closer contacts with other organizations and studying the point of view of the public. In live stock sanitary work which deals largely with regulations, it is highly desirable to present the problem to the public, especially to persons directly concerned, in such a way as to bring about sympathetic understanding. For instance, to condemn several reactors on a farm is a routine procedure for a veterinary inspector, while it may be an outstanding event in the experience of the farmer whose herd has been tested for the first time. It is therefore highly desirable that the condemnation of live stock be conducted with due consideration for the other person, and in a manner flavored by the Golden Rule.

With the growing tendency toward the study of avian tuberculosis, it seems desirable to establish suitable contacts with officials of poultry associations and superintendents of poultry shows. Such contacts are likely to bear abundant fruit when matters of mutual interest may arise. Furthermore, the influence of the press can scarcely be overestimated, and we should cultivate such contacts for most certainly no scientific organization can be indifferent to the attitude of the lay public.

A noteworthy betterment of conditions for the production of domestic animals has occurred during the past year. There was excellent progress in the eradication and control of important animal diseases. Improvement of live stock by better breeding made further gains. Research and experimentation yielded many important discoveries. Regulatory work also showed general public compliance with the laws and regulations for protecting and otherwise benefiting the live stock industry.

It is a truism that agriculture is the foundation industry of our country. It is essential to our social and political welfare that it be made more profitable. The most important item in increasing agricultural prosperity is profitable production of live stock. The United States Live Stock Sanitary Association is admirably adapted to render great service in improving the condition of live stock producers. We have combined in this organization both the scientific and the practical factors. The closer the alliance and cooperation of these powerful forces the greater will be the influence and usefulness of the organization in helping to better live stock conditions, in increasing our national wealth, in protecting public health and in adding to the comfort and happiness of rural life.

Dr. Fred Hayes of the animal husbandry division of the College of Agriculture, Davis, Cal., addressed the Rotarians of Woodland, Cal., October 26th. He gave an interesting account of the progress made in the profession and pointed out the important part played by veterinary science in the inspection of foods and the control of animal diseases.



VIEWS OF THE BLUE CROSS ANIMAL HOSPITAL

Upper left, Operating Room and Drug Room; upper right, Office, Dr. Peck in the foreground, Dr. Blackburn in the rear; center, The Hospital Building; lower left, Distemper and Mange Wards in rear of building; lower right, Main Ward. The dimensions of this ward are 23½x65 feet.

Accrediting Flocks in Illinois

For a period of about three years the State Department of Agriculture of Illinois has been accrediting flocks of purebred and grade chickens as bacillary white diarrhea free. This work has been under the immediate charge of Dr. F. A. Laird, Chief Veterinarian of the Illinois Department of Agriculture.

More than 150,000 chickens have been tested. The macroscopic agglutination test has been used. All blood samples are collected by veterinarians; the fee for this being 5 cents per bird. A total of more than $7,500.00 has been paid the 197 Illinois veterinarians who have participated in this work.

To date, all blood samples have been tested at the State University Laboratory. The state veterinarian has recently designated the following veterinarians who may make the blood tests for official accredation:

These veterinarians will charge a fee of 5 cents per blood sample for making the agglutination test As heretofore, no tests will be recognized by the state unless the blood sample be collected by a veterinarian and the test made at an approved laboratory.

Much experimental work is being done in Illinois on the Pullorin test. More than 20,000 such tests have already been made and checked by the agglutination test.

AN ELABORATE SMALL ANIMAL HOSPITAL

The illustrations on the opposite page show views of the Blue Cross Dog and Cat Hospital, 713 North Main St., Ft. Worth, Texas.

This is one of the finest small animal hospitals anywhere and represents an investment of $18,000. It is located a half mile from the center of the city on the main traveled thoroughfare of the city. A thoroughfare over which 1,200 automobiles pass the hospital hourly throughout the day.

Drs. H. L. Blackburn and M. A. Peck, proprietors of the Blue Cross Dog and Cat Hospital, have an abiding faith in the future of veterinary practice in Fort Worth and the Southwest, generally.

The estimated economic value of the men, women and children of the United States is fifteen hundred billion dollars. The estimated value of a baby is over $9,000.00. On this basis, we are a rich nation and a realization of these values should be a stimulus for increased population.

POLICY ADOPTED BY ILLINOIS VETERINARY ASSOCIATION

"This association should assist in getting before the public the information that approximately only 60 per cent of the meat sold throughout Illinois, outside the larger cities, is prepared under veterinary supervision of the Federal government. That 40 per cent of meat offered for public use is slaughtered at local plants, where no system of inspection is maintained. We believe the public is entitled to have all meats and meat food products, including poultry, pass as rigid an inspection as that of the B. A. I. and that this association should bring to the attention of the public the desirability of veterinary inspection for all local slaughtering plants. There is no adequate dairy inspection maintained over the production of milk and dairy products except by some cities with ordinances. Veterinary inspection of the health of cows producing milk for public use, and of the sanitary conditions surrounding dairies furnishing such milk and dairy products should be maintained for the protection of the public health. We believe it to be the duty of this association to sell this service to the public.

"As a means of accomplishing this end we suggest news articles be furnished by the members of our association for publication in their local papers. These articles should set forth the benefits to the public of such veterinary service.

"We further suggest that addresses on these matters be presented to the various local organizations such as Kiwanis, Rotary, Lions, Commercial and Women's Clubs. The benefits of such procedure are clearly manifest. Such cities as Rockford, Aurora, Joliet, Danville, Champaign-Urbana, Bloomington-Normal, Decatur, Springfield, Quincy, Galesburg, Rock Island, Moline, and others could well afford to employ a veterinarian for full time duty.

"Counties in which no large city is located might be the logical unit for such work. It may be possible to create permanent county positions for veterinarians now employed for tuberculin testing only. Such work would increase their duties and responsibilities while at the same time bringing to the public a broader realization of the usefulness of veterinary service. Such service should not interfere with the local practitioner, but in certain instances might benefit him by arranging to have him assist with the work."

W. H. Welch,
L. N. Morin,
J. S. Koen, Chairman.

One of the best authorities on the subject of the relationship of bovine tuberculosis to the human family is Dr. A. Stanley Griffith of the pathological department of the field laboratories, University of Cambridge. In a paper entitled "The Danger of Tuberculosis Milk," Dr. Griffith gives figures from one of his investigations showing that 50 per cent. of the lupus cases and 40 per cent. of the bone and joint cases involved in his investigation were of bovine origin.

Of the 45 cases examined in children under 15 years of age, 20 were affected with the human type of the tubercle organism and 17 with the bovine type.

J. A. Kiernan.

TIMELY TRICHINOSIS WARNING

"Cook pork well" is the seasonal warning of the United States Department of Agriculture. Uncooked or poorly cooked pork may result in the serious illness known as trichinosis. This disease, which is painful and frequently fatal, is caused by a small parasite that sometimes occurs in pork.

Hogs that harbor the parasites of trichinosis show no symptoms, and pork containing the parasites looks exactly the same as other pork. The most practical means of preventing the disease is thorough cooking of pork products. The heat of cooking destroys the parasites. Hence well-cooked pork is safe and trichinosis cannot be acquired if the simple rule is followed of cooking pork well before it is eaten.

Saddle horses are usually classified into the five-gaited saddler and the walk-trot-and-canter or three-gaited horse. The size of the three-gaited horse is variable according to the character of the work and the weight of the rider. The height is usually from 15 hands 1 inch to 15 hands 3 inches, and weight from 1,000 to 1,250 pounds. The principal requirements in three-gaited horses are style, quality, finish and good manners. Dark colors are much preferred in saddle classes, including bay, brown and chestnut. These are produced by using purebred saddle stock or Thoroughbred sires on mares of quality having saddle conformation.

Polo ponies should range in height from 14 hands 2 inches to 15 hands 1 inch and in weight from 850 to 1,050 pounds. The polo pony must combine speed, activity, agility and general handiness with weight-carrying ability. He must have a light mouth and must have the ability to stop, start and wheel quickly. The game of polo requires a lot of endurance and wearing quality in the pony; hence the conformation of the horse, especially in the hind quarters, feet and legs, largely determines his adaptability to the game.

Side-Lights on Tuberculosis Eradication*

THE following, taken from the annual report of the Tuberculosis Eradication Division for the fiscal year ending June 30, 1926, shows gratifying progress being made in the eradication work:

There was tested during the fiscal year 8,650,780 cattle in 774,728 herds, from which were removed 323,084 reactors, or 3.7 per cent. The slight increase in the percentage of reactors compared with recent years was unquestionably due to the intensive campaigns conducted in two states in accordance with the requirements of a city ordinance.

Iowa First in Amount of Testing

The report indicates that Iowa led all the states of the Union for the year with a total of 1,192,156 cattle tested, followed by Wisconsin with 982,763; Illinois, with 69,511; New York, with 661,782, and Minnesota with 650,181. Other states with more than 200,000 cattle tested for the year were Pennsylvania, Michigan, Nebraska, Ohio, Indiana, and North Dakota.

There were reported 93,277 premises as showing infection of tuberculosis. This indicates that approximately 1 out of every 8 premises upon which tests were made harbored infected cattle.

Avian Tuberculosis Receives Attention

In the course of the regular tuberculosis-eradication work, surveys were made of 157,950 flocks of poultry containing 14,012,923 birds, with the result that 9,751 flocks or 6.2 per cent, showed physical evidence of avian tuberculosis. There were posted 15,363 birds, of which 10,279 were found to be diseased. This survey indicates the necessity for systematic campaigns for the eradication of avian tuberculosis.

Permits were issued covering the interstate movement of 82,067 tuberculous cattle for immediate slaughter. It is noteworthy that no permits were issued for the movement of tuberculous cattle interstate for breeding purposes.

A total of 355,836 cattle were tested for interstate movement by approved veterinarians, from which 2,438 reactors, or a little less than 1 per cent, were removed. This is an increase over the previous year. This report shows that Wisconsin led by shipping more than 66,000 cattle. Four other states showed shipments of more than 20,000 as follows: Minnesota, about 53,000; Tennessee, nearly 37,000; Texas, 22,000, and Mississippi approximately 21,000. Incidentally, the records of the Bureau show that there are on the approved list 9,016 veterinarians.

On June 30, 1926, the records showed that 96,392 herds containing more than 1,500,000 cattle had been established as fully accredited. This is an increase of approximately 24,000 herds over the preceding fiscal year.

More than 1,300,000 herds, containing over 10,500,000 cattle were reported as having passed one clean test in process of accreditation or in the course of area testing. This shows an increase of more than 380,000 herds over the preceding year.

The total under supervision at the end of the fiscal year was 1,556,336 herds containing 15,131,345 cattle. This is approximately 24.5 per cent of the total cattle population of the United States.

Under the uniform plan of handling herds, accredited veterinarians tested during the fiscal year 43,921 herds containing 788,995 cattle, from which were removed 22,529 reactors. The cattle tested is in comparison with the total of about 605,000 for the fiscal year 1925. The records show that there are on the accredited list 6,619 practitioners.

At the end of the fiscal year there were in the United States 198 counties which had been classed as modified accredited areas.

*United States Department of Agriculture Bureau of Animal Industry. Tuberculosis Eradication Division, October, 1926.

There were 329 counties, including the modified areas, which had completed one test of all the cattle within their borders. In addition, there were 427 other counties extensively engaged in the work, a total of 756 counties actively working to eradicate the disease from their borders.

It is interesting to note from reports covering the year's work that more than $1,067,000 was expended by the respective counties for the eradication of tuberculosis, exclusive of indemnity. This is an increase of approximately $372,000 over the previous fiscal year.

Despite the marked increase in the number of cattle condemned and slaughtered on account of reacting to the tuberculin test, the average Federal indemnity was reduced from $17.11 for 1925 to $14.51 for 1926. It is likewise gratifying to know that the average salvage obtained for tuberculous carcasses increased from $19.12 in 1925 to $24.64 in 1926. Watchfulness in the marketing of reactors and the policy to obtain the highest salvage possible is indicative of efficient service in the eradication work.

Another State Enacts Legislation Providing Indemnity Funds

Since the last issue of "Side-Lights" information has been received that the state of Louisiana has enacted legislation which will provide a fund af approximately $20,000 per year for indemnity purposes. This leaves only four states in the Union where indemnity is not paid.

Retesting of Infected Herds

The following, taken from a report of the Nebraska State Department of Agriculture for the calendar year 1925, deserves special mention:

"The real menace of tuberculosis of livestock is the infected herd, and especially the infected individual of that herd. Initial testing of the county area makes possible not only the removal of the diseased animals designated by the test, but the cataloging of infected herds and premises. By consistent and systematic follow-up work in the way of retesting and application of sanitary measures, the individual sources of danger are eliminated, making safe and possible the eventual accrediting of the county. The retesting of infected herds was carried on with the same personnel used in conducting the general area work, and it is looked upon as one of the most important phases of the tuberculosis-eradication campaign. When infection was found in a herd it was quarantined and subjected to retests until reactors were no longer revealed."

Veterinary Service of the Right Kind Needed

The following is abstracted from an editorial from the Chicago Drovers Journal of January, 1926, entitled "The Fight Against Animal Diseases." After asking the question "Would your community be willing to get along without veterinary service," the article states as follows:

"If the veterinary profession does not always enjoy the recognition it deserves, it is because people do not know of its achievements. * * * The farm animal is subject to diseases just as is the human. Some of these diseases are contagious and frequently fatal. * * * The livestock industry needs an adequate and competent veterinary service constantly on guard to protect the health of farm animals. * * * For its own protection, it needs to acquire a better understanding and a greater appreciation of veterinary service. Some veterinarians need to learn, for instance, that the tuberculin test is always a serious matter, sometimes almost a tragedy, as in the case of a farmer who perhaps for many years has carefully bred up his herd only to see his finest animals sacrificed to the test. * * * It is no occasion for light remarks. It is a time to show sympathy and understanding, and also, to offer, in a tactful manner, some evidence to strengthen the conviction of the owner that he is on the right course in freeing his herd of disease. Better understanding should be promoted for the good of all concerned. The future of veterinary protective service to American animal industry is at stake. That is a responsibility of the present generation. What kind of a veterinary force is being promoted for the future?"

The Economic Value of Tuberculosis Eradication

The following is abstracted from the "News Service, Iowa Department of Agriculture," under date of August 20, 1926:

" 'Figures which have been kept by an Iowa packer, answer the question of many people as to the benefits which accrue from the work of eradicating bovine tuberculosis,' states M. G. Thornburg, Secretary of Agriculture. 'In 1919, the average loss per hog caused by tuberculosis infection was 75 cents. This is the loss per hog killed in the plant. In 1920, the loss declined to 66 cents, in 1921, to 49 cents and in 1922 to 32 cents. Since 1923, the loss has further declined to 26 cents.' Another angle of the returns is shown in a letter from F. C. McClung, chairman of the Board of Supervisors of Wapello County. Wapello County has been modified since January 2, 1925, and the hog breeders have been getting a premium of ten cents per hundred pounds on all hogs sold. Mr. McClung states, 'Up to date, Morrell & Co., local packers, who buy most of the hogs bred and fed in Wapello County, have paid out approximately $17,000 in premium money to the farmers of this county. The total cost of testing the cattle of this county (and this includes indemnities paid to farmers for their re-acting cattle) was $8,689.44. Of this sum, the state of Iowa paid $2,-314.73 and the Federal government paid $2,-314.73. Our local county, out of a tuberculosis fund, raised the first year by a levy of 1.05 mills on all the taxable property of the county, paid the remaining $4,059.98.' "

Michigan Reports on Avian Tuberculosis Eradication Work

A report received under date of September 18, 1926, from Michigan relative to the control of avian tuberculosis in that state is of considerable interest. It indicates that for the last two years the work has been almost wholly along investigational lines which included surveys recommended by the Bureau, and which were made in connection with their regular bovine eradication work. This work was valuable in that poultry owners became better informed relative to the ravages of tuberculosis in their flocks and its transmission to swine. Following this work, an attempt was made which would bring the State Department into closer relationship with a limited number of flock owners in order to obtain further information concerning a practicable method of handling the individual flocks, both infected as well as those believed to be free. This plan included use of tuberculin as a diagnostic agent in poultry tuberculosis.

To do this, a plan was evolved which was termed "The Tuberculosis Free Farm Plan." This included the testing of the cattle, hogs, and poultry. Twenty-five farms, all located in the modified area, were selected. The project was started in April, 1926. Of these 25 farms there were three which, upon physical examination, showed avian tuberculosis. Therefore, no tuberculin test was applied to the fowls. Upon the 22 farms where the tuberculin test was applied, 2,676 chickens were tested, revealing 84 reactors located upon 13 farms. The report calls attention to the fact that infection was found through the use of tuberculin on 59 per cent of the supposedly free farms. It was also noted that only one of the reacting chickens failed to show lesions on post-mortem.

Seventeen Out of 18 Reactors Due to Avian Infection

In continuing this survey, the double tuberculin test was applied to the breeding swine on 22 farms, there being three farms upon which no hogs were kept. There were 301 hogs tested, 18 reactors being located upon nine farms. Of these 18 reactors, 10 reacted to both the standard and avian tuberculin, one to the standard tuberculin only, and seven to avian tuberculin only. In other words, there were 17 out of the 18 reactors which showed evidence of avian infection as indicated by the test. Of the 25 farms, there were eight upon which no evidence of tuberculous infection of any type was found, while infection was disclosed among either the poultry, swine, or both upon 17, or 68 per cent, of the farms. Of these, there were eight with infected poultry only, four with infected swine only, and five where infection was among both the swine and poultry. Further, the report in-

dicates that the belief in the accuracy of the tuberculin test upon fowls was demonstrated when the test was applied by an experienced operator. The belief was expressed that the testing of swine is also practicable, and that the double test upon breeding swine should be used upon farms where avian infection is known to exist.

Another interesting phase of the report indicates that the agreement under which these herds were taken under supervision included a recommendation that all members of the family on the farm submit to a physical examination for tuberculosis bi-annually by a competent physician. Surveys of this character are of great assistance in planning campaigns for the control and eradication of avian tuberculosis, and may aid in throwing light upon possible connection between the various types of tubercle organisms.

Testing Flocks for Avian Tuberculosis

In "Side-Lights" for May, 1926, reference was made to the follow-up work in avian eradication work in Miner County, South Dakota. Recent information indicates that two veterinary inspectors representing the state of South Dakota and this Bureau inaugurated a campaign of flock testing in this county for the purpose of determining the extent of the disease at this time. During the first day's work nine flocks containing 1,998 birds which were observed showed 326 reactors and two clinical cases. The report states that 60 per cent of the old birds in one of the flocks observed reacted, while in another flock approximately 50 per cent of the old birds were removed on account of tuberculosis. The two clinical cases referred to failed to react, but were found badly infected on post-mortem examination. Infection was found in 100 per cent of the flocks observed at the time the report was made. The work was well received by the livestock owners who signed a special agreement covering the avian eradication work. The plan includes a requirement for the disposal of the entire flock where the percentage of reactors exceeds 25 per cent, and a thorough cleaning and disinfecting of the premises after the removal of the infected flocks. All infected flocks are to be retested in 90 days. There were but two spring chickens classed as reactors out of the 326 diseased birds, the remainder being hens approximately 18 months of age or older. A complete report on this work will be interesting.

Swine from Modified Accredited Areas

A report from Dr. W. T. Spencer, Livestock Commissioner of the Omaha Livestock Exchange, shows that during the month of August, 1926, there were received at the Omaha Livestock Exchange a little more than 10,000 hogs from Nebraska modified areas. These receipts entitled the owners to premiums of about $3,200. The retentions for tuberculosis were about 7 per cent. The condemnations were reduced to only 25 hogs for the entire receipts.

Establishing a New Milk Market As the Result of an Area Test

A report received some months ago indicates that Defiance County, Ohio, has materially benefited as a result of its first complete area test. A Chicago, Illinois, concern, desiring to secure additional supplies with which they might conform to the Chicago city ordinance, established a milk-receiving station in this county at a cost of approximately $75,000. It is believed that this market will return to the county about $350,000 a year from milk sales alone. This area test certainly paid.

New York Shows Marked Progress

A report from the Bureau office in New York indicates that plans have been perfected to apply first tests to 115 additional townships by January 1, 1927. When this is accomplished it will bring the total townships tested up to 500. It is interesting to note that there are 940 townships in the State, and that when these 500 have been completed more than one-half of the State will have been tested one or more times.

North Carolina Approaches Completion of One State Wide Test

On August 30, 1926, a report from the local Bureau office in North Carolina indicates that there are now 85 of their approximately 100 counties engaged in area

work, 67 of which have been classed as modified accredited areas.

S pported by Dr. Chas. H. Mayo

Hoard's Dairyman, in its issue of May 25, 1926, in an editorial entitled "The Human Side" quotes Dr. Chas. H. Mayo, of the Mayo clinic of Rochester, Minn., concerning the eradication of tuberculosis as follows:

"I believe in pasteurization, but I also strongly believe in the eradication of tuberculous animals from dairy herds; this can be done by careful testing. The testing should be repeated twice a year until the herd is free from disease. This is the only safe way for children on the farms where pasteurized milk cannot be obtained. The majority of cases of tuberculosis in the neck, intestines, and abdomen are found in children from the farms and not from the city."

Additional Support for City Ordinances

It was reported during May, 1926, that the City Ordinance of the City of Portland, Oreg., which was referred to in "Side-Lights" of May, 1926, was contested in the courts and declared constitutionally and legally operative. Under date of May 25, 1926, the "Morning Oregonian," in an editorial, states as follows:

"No greater calamity could befall any community than to be deprived, by technicality or otherwise, of the right to exercise a vigilant scrutiny of its milk supply, and so the legal victory won by the Portland city attorney's office is beyond measure important. Judge Rossman puts his finger unerringly on the essential aspects of the entire issue when he points out that 'when the consumer takes into his hand a bottle of milk, there may be lurking within it, entirely unbeknown to him, elements that will bring him disease and even death.' This is not overstatement. It is widely conceded that communities not only have the right to supervise their water supplies but that authorities who fail to do so are guilty of gross malfeasance in office. No city or town that we know of would for an instant tolerate remissness in this regard. Milk, the universal food of young Americans and an item of extensive use by adults, is in the same category. It is the plain duty of cities, which the court has again upheld, to see that no opportunity shall be afforded for its contamination. The provisions of the ordinance regarding content of butter fat and other nutriments are important, but belong in another classification. They relate to the aspect of legislation pertaining to adulteration in general. They are desirable but not indispensable. The requirement, however, that no milk shall be offered for sale that has not been produced under nearly nonpathogenic conditions is fundamental. Milk control is as much a part of the duty of the authorities as protection against crime and fires."

Court Upholds the Right of Municipalities to Pass Ordinances

The "Cleveland Plain Dealer" reports the action taken by Judge Silbert of the Common Pleas Court, Cleveland, Ohio, as to whether or not the City of Cleveland has the right to exclude milk from herds where there is a question as to sanitary condition of the premises, and where the cattle have not been tuberculin tested. In refusing an injunction against the City Health Department, applied for by the owner of a dairy, Judge Silbert said, in part, as follows:

"To understand the situation in this case, the history of pure food regulation must, to an extent, be gone into. The necessity of this regulation is no longer an open question. Its vital effect upon public health is uniformly recognized. . . The safety of the public health of a city depends mainly upon the quality of its milk, water and other food supplies. Maintenance of a proper standard of quality rests upon the conscience and the ability of those public officers who are charged by law with the performance of this vital public duty."

Work Oxen Badly Infected

A report from Florida indicates that several months ago a herd of 40 oxen was tested, 28 of which were found to be tuberculous. On slaughter 14 of the 28 reactors were condemned as unfit for food purposes. This is a rather surprising condition very frequently found in herds of this character in Southern States where the incidence of bovine tuberculosis is relatively rare.

INTERNAL SECRETIONS

The blood is the main transportation system of the animal body. It traffics in various kinds of merchandise. It must travel on exact schedule time, for delay would wreak disaster to the tissues it serves. Food, fuel and oxygen must be delivered exactly when needed if the cells are to breathe and maintain their integrity. The freight of waste matter must be shipped at once from the cells for its accumulation is destructive to them. There is no halt for loading or unloading; the exchange must be made while the blood is in motion.

It is from this basic fluid of the body that the various glands draw the raw material which they elaborate into their finished products—the secretions. In the case of the endocrine or ductless glands, those which produce internal secretions or hormones, the blood not only furnishes the raw material but receives the finished product and transports it to the parts requiring it. For the welfare of the body, the internal secretions are quite as important as any of the other secretions. It is known that the internal secretion of the adrenal glands is essential to life. The disease or removal of these glands is fatal. The blood is no longer able to deliver a product, in this case very infinitesimal in amount, to the tissues which are absolutely dependent upon it.

The glands of the endocrine system vary in importance. The disease or removal of the pituitary, thyroid or parathyroid glands produce profound effects. The decreased amount or absence of the hormone insulin from the pancreas and its relation to diabetes has attracted much recent attention. The hormone from the interstitial cells, associated with the sex glands, has been shown to have an influence upon temperament and bodily condition. The blood deprived of any of its hormones is an abnormal blood, and its relation to the tissues on which the hormone acts is correspondingly changed.

A soil deficient in quantity or in the absence of certain constituents may nevertheless produce crops, but these will likewise be deficient in quantity or quality. In a similar way the various tissue crops or activities of the body will suffer if deprived, by disease or operative interference, of any of the constituents which nature intended them to have.—Pierre A. Fish and Charles E. Hayden in *The Cornell Veterinarian.*

ANIMAL DIETARY AND DISEASE

Sir Robert Greig, chairman of the Board of Agriculture, Scotland, in his Chadwick lecture at the Royal Society of Arts, said the investigation of the mineral requirements of animals had added a new field of exploration which offered promising results. The amount of mineral matter in a perfect food such as milk was small, but evidence accumulated to show that health and growth might be affected by the absence of an almost infinitesimal quantity of an element such as iron. Diseases in sheep and pigs resembling rickets in man could be prevented and cured by trifling additions of minerals to the food. It was possible that the prevalence of tuberculosis in the milking herds of this country was partly due to the susceptibility to disease resulting from deterioration of the constitution through defects in dieting.

Some 200,000,000 sheep and the same number of cattle were maintained on natural pastures throughout the Empire and these pastures were found to differ enormously in their ability to produce full growth in the animals grazed upon them. Moreover, certain pastures were more unhealthy than others and disease and sterility were common on these. It was found that the mineral contents of the pastures were definitely related to the prevalence of disease. The economic importance of this discovery was incalculable.—*The Times* (London, England).

An important law prohibits oil pollution in navigable waters, under heavy penalties. Oil waste destroys oysters and other shellfish and the fertility of fish spawn, and covers the feathers of ducks, geese, and other water birds, causing the death of untold thousands of them each year. An international treaty will be required to prevent the dumping of oil on the high seas beyond the jurisdiction of the maritime nations.

GROWING PLANTS AS POSSIBLE CARRIERS OF ANTHRAX

Bulletin No. 196 of the Louisiana Agricultural Experiment Station, by Drs. Harry Morris and H. K. Riley, describes an experiment to determine to what extent forage grown on anthrax contaminated soil may carry the spore of anthrax and thus endanger animals fed upon such forage. The experiment showed that there is a real danger in feeding animals forage grown on land contaminated by anthrax spores.

The following is a summary of their conclusions from this experiment:

1. The results indicate that, under laboratory conditions anthrax spores are carried from artificially inoculated soil by germinating and growing plants.

2. The results indicate that anthrax spores were carried from inoculated soil by germinating and growing corn, oats, rice and bean plants.

3. The results from a few tests show that anthrax spores were carried from the soil by Bermuda grass and bull grass.

4. The anthrax spores were carried from the soil on the surface of the plant and not in the plant tissue.

5. Washing the plants with water for three consecutive days only removed a portion of the anthrax spores.

The results obtained in this work should again remind the livestock men of Louisiana of the great importance of sanitation in the control of anthrax and especially of the necessity for complete destruction of anthrax carcasses to prevent soil inoculation and subsequent spread of the disease through forage contamination. Once a soil is inoculated with anthrax spores it is always a menace to the live stock industry. But soil inoculation can be prevented in Louisiana by the prompt and complete destruction of all anthrax carcasses.

Horses of the wagon-horse class vary somewhat in conformation, height and weight, depending upon the work which they do. This class includes Expressers, Delivery-wagon horses and Artillery horses, with height and weight specifications as follows: Expressers: height, 15 hands 3 inches to 16 hands 2 inches; weight, 1,350 to 1,500 pounds; Artillery horses: height, 15 hands 1 inch to 16 hands; weight, 1,050 to 1,200 pounds; Delivery-wagon horses: height, 15 hands to 16 hands, weight, 1,100 to 1,400 pounds.

MILK RECOMMENDED FOR COCCIDIOSIS

Milk will control coccidiosis of young chicks, and the form of milk used is not of importance as long as a sufficient quantity is consumed by the chicks, say Drs. J. R. Beach and D. E. Davis, of the veterinary division, College of Agriculture, University of California, in a circular just issued.

Coccidiosis, caused by a parasite, usually from contaminated soil, may best be controlled through the use of milk, says the circular, although proper sanitation and care are essential. While the form of the milk is not essential, dry skim-milk possesses advantages which make it somewhat more desirable for general use. Some of these are as follows:

It is the most condensed form of milk. Therefore, it is easier to transport and a sufficient quantity may be more easily consumed. A good grade of dry skim-milk contains about 2.5 per cent of water, semi-solid buttermilk from 60 to 70 per cent of water, and buttermilk about 91 per cent of water.

It is easier to feed than a liquid milk.

It is relished by chickens. Buttermilk is sometimes unpalatable.

It keeps well if stored in tight containers. Therefore, a quantity sufficient to last for several weeks may be obtained at one time and daily trips to a creamery avoided. This quality also makes milk available in localities distant from dairying districts.

It promotes rapid development of chicks.

It provides a practical means of feeding chicks during the period of greatest danger from coccidiosis (from four to eight weeks of age), so that they are less liable to become fatally infected when they are run on contaminated soil.—Stockton (Cal.) Record.

Violation of Narcotic Law by Veterinarian Malpractice

By LESLIE CHILDS

AS a general rule, the question of when, and under what circumstances, the violation of a law by a medical practitioner will constitute malpractice is one of fact. It follows, that each case of this kind must be decided in the light of the particular facts and circumstances involved, which precludes the statement of a hard and fast rule that would apply in all situations.

However, as an example of judicial construction in a case of this character, the recent South Carolina decision of Gregory v. McInnis, 134 S. E. 527, is worthy of examination. The case involved the question of whether or not the violation of the Harrison Narcotic Law, by a veterinary surgeon, justified the refusal of a license to practice, and arose under the following facts.

Veterinarian Convicted of Law Violation

The petitioner, a veterinary surgeon, was convicted of violating the Harrison Narcotic Law, and sentenced to prison. Following this, he applied for a license to practice his profession in the state of South Carolina.

The State Board of Veterinary Examiners declined to issue him a license, on the ground, among other things, that his violation of the narcotic law constituted "gross malpractice" within the terms of the South Carolina Statute. The section of the law relied upon by the board provided as follows:

"The said board shall have the right to refuse to issue a license to any applicant upon the grounds of gross immorality or gross malpractice, and shall have like power, upon satisfactory cause shown, to revoke such license on said grounds after due hearing."

Following this ruling by the board, the petitioner applied to the courts, and upon the trial of the cause the lower court ordered the board to issue the petitioner a license. From this judgment the board appealed to the Supreme Court of South Carolina, and here, after a review of the record, the court in considering the question presented said:

The Reasoning of the Court

"While it is true, as held by the circuit judge, that the Harrison Act is a police regulation, we disagree with him that the violation of that act does not constitute 'gross malpractice.' The use of opium as necessary for relief of pain has been known for many years, but it is also well recognized that the abuse of this powerful drug is attendant with great danger to the health, happiness, morals, and peace of the people.

"The purpose of the Harrison Act was to allow the use of the drug when needful, but to guard against its indiscriminate dispensation, and to prevent the evil effects which it produced. To carry out the idea of placing the drug within the reach of those lawfully entitled to have it administered to them, provisions are made in the law for its being prescribed and dispensed by physicians, dentists, and veterinary surgeons.

"It is well known that an unscrupulous physician, dentist, or veterinarian has great opportunities to circumvent the intention of the law, and that the traffic in opium is financially fruitful. While a veterinary surgeon may do great good with this powerful medicine in the re-

lieving of dumb animals from their sufferings, he may bring about great harm to human beings, and to the peace of the state, by dispensing and bartering the drug illegally. . . .

"The only legal question pertaining to this matter is whether or not the offenses charged against the petitioner, and of which he was convicted, were such as to establish that he was guilty of 'gross malpractice.' The term 'malpractice' is defined in Corpus Juris, as follows:

" 'Any professional misconduct or any unreasonable lack of skill or fidelity in the performance of professional or fiduciary duties; evil practice; illegal or immoral conduct; improper or immoral conduct; misbehavior; objectionable practice; practice contrary to established rules; . . .' "

Following the foregoing line of reasoning, and the statement of the definition of "malpractice," the court in stating its conclusion on the whole case, in the light of its reasoning and the definition quoted, said:

What the Court Decided

"We think the crime of which the petitioner was convicted showed that he had done 'professional misconduct'; certainly, it was 'illegal conduct'; it was also 'objectionable practice,' and 'practice contrary to established rules.' The jury, who tried him, found that his acts were 'willful.' The exception, which complains of the finding of the circuit judge that the petitioner was not guilty of 'gross malpractice,' is sustained. . . ."

In conclusion the court reversed the judgment of the trial court in favor of the petitioner, and ordered his petition dismissed. Holding, as outlined in the opinion, that his violation of the narcotic law constituted "gross malpractice," and justified the board of examiners in refusing to issue him a license, under the provisions of the South Carolina Statute.

The foregoing decision is one of the most positive the books contain, upon the specific question involved. For this reason, the language of the court in its reasoning has been given at some length, in order that the basis for the holding announced might clearly appear. And, in view of the commonly accepted definition of the word "malpractice," the conclusion of the court that the petitioner was guilty thereof seems well sustained.

HOW SAFE IS ALUM?

I have given large doses of alum, well diluted with water with the stomach tube, in overloading of the stomach with wheat to prevent laminitis as well as a curative agent. In subjects that have died, and on which I have performed an autopsy, I have found the alum collected in one place of the stomach, and in all instances the mucous membrane at this place was destroyed. Those horses which recover have not suffered any ill-effect from it to my knowledge; but it is logical to believe that at least a certain percentage of them, where healing does not occur immediately, may suffer from gastric ulcers. On account of this I now hesitate to administer this valuable drug for laminitis.

O. W. Johnson, D.V.M.
Davenport, Wash.

BENESCH ANESTHESIA A GRATIFYING SUCCESS

I used one Abbott 3-grain procaine tablet, dissolved in 30-cc (one ounce) of distilled water, last night on an obstetrical case in a big young heifer that would not stand while being worked on.

After injecting 22-cc of this solution (¾ of 1%), according to the method of Doctor Benesch, the cow got up and the job was finished with no straining whatever.

The tail was limber as a rag. This furnished an ideal indicator as to commencement, degree and duration of anesthesia.

I think procaine will be very valuable for use in cases of everted uterus and in removing retained placentae.

Ashland, Wis. C. W. Clark, D.V.M.

Feeding Minerals to Dairy Cows

By A. J. SCOTT, Vicksburg, Mich.

UNIVERSITY of Michigan Quarterly Bulletin, May, 1925, issue reads as follows:

"Minerals are needed in the dairy ration to maintain the health and efficiency of the herd.

"It is common information that dairy cattle need minerals as a part of their daily ration. Minerals are needed to develop the skeleton and for the proper functioning of the glands and organs of the animal body. When cattle were first domesticated, the minerals found in the natural feeding stuffs were ample to meet the needs for body maintenance and milk production, since only enough milk was produced to give the calf a start in life. The modern dairy cow, however, is a highly specialized machine for the production of milk, which is rich in mineral salts, especially lime and phosphorus.

"Not only has the tremendous increase in milk production caused a greater mineral requirement, but the feeds used today are often grown on soils depleted in the essential mineral elements, resulting in a deficiency in the crops grown on such soils.

"The high producing dairy cow, however, must have the roughage supplemented with concentrates to furnish protein and energy for heavy milk production. Concentrates, especially the cereal grains, are low in certain necessary minerals.

Iodin in the Ration

"A small amount of iodin is needed in the ration of dairy cattle for the proper functioning of the thyroid gland. A deficiency of this element results in goitre or "big neck" in calves. Iodin is often lacking in soils distant from the sea, and consequently goitre is more prevalent in such regions than near the sea coast. Decaying sea weeds liberate this element, which is carried by the wind over the land and taken up from the soil by the crops.

"Since milk and butter are very good natural sources of iodin in the human diet, it is important that the cows producing milk for human food receive iodin in their ration.

Lime and Phosphorus

"The two mineral elements most likely to be deficient in the ration are lime and phosphorus. These two minerals combined make up about 85 per cent of the bone. Lime is also necessary in milk production and the proper functioning of the blood. Phosphorus is not only necessary for bone building and milk production, but also for muscle development. When these two important elements are not supplied in the ration in sufficient amounts and in the right proportion, the result is a loss of lime and phosphorus from the bones which may result in weak bones and diseases of a rachitic nature.

"Minerals are also needed for proper reproduction. Considerable lime and phosphorus are found in the skeleton of the fetus. Dr. Hart and his co-workers at the Wisconsin Experiment Station were unable to obtain good reproduction with cattle on the oat plant alone or the wheat plant alone until lime was added to the ration. Dr. Meigs has reported a decrease in breeding troubles on a ration of grain, silage, and timothy hay when calcium carbonate was added to the ration.

Grains

"The grains, especially the cereals, are very low in lime.

Feeding Minerals on Pasture

"The pastures are usually low in phosphorus in the spring and early summer, previous to the bloom and seed stages. Where pasture is the only feed at this time of the year, the heavy producing cows often drop in production and in extreme cases depraved appetite follows. Depraved appetite is a

DEC 30 1926

craving for things not classed as food, such as wood, dirt, rags, bones, etc.

Mineral Mixtures

"Many expensive complex mineral mixtures are being fed to dairy cattle. These mixtures usually consist of different combinations of bone meal, calcium carbonate, common salt, copperas, sulphur, Glauber's salts, epsom salts, potassium or sodium iodid, hardwood ashes, and charcoal. The idea of such a mixture being, if one mineral did not do the work another one would. In the past the belief has been prevalent that if a mineral mixture failed to do good, at least it would do no harm. Results at this station, where heifers are being fed a complex mineral mixture in addition to a basal ration, show that a mineral mixture may be harmful to dairy heifers when fed over a long period at the rate of two ounces of mineral daily. Minerals are medicines and should be used accordingly."

In my own practice I use quite a simple formula—a formula recommended by one of the State Experiment Stations and manufactured by a reliable concern.

I have obtained excellent results by feeding it not only to dairy cows, but to other farm animals as well. For example, sheep. I had several clients complaining that their sheep were eating wool from each other's back. Feeding them a good mineral feed positively stops this.

No other food producing quadruped has a greater proportionate mineral requirement than the heavy fleeced ewe. The fleece has a large mineral content and the demands of reproduction in case of twins or triplets, is immense, N. Y. Agricultural Bulletin 130 says:

"The lamb is a rapidly growing animal and needs plenty of bone forming feed. It would seem worth while to consider the calcium and phosphorus content when choosing rations for growing sheep, and to add a mineral supplement when the ration is low in either of these elements."

I do not believe in having a different mineral feed for each animal. A good formula, including especially lime, phosphorus, iodid, sodium and chlorin, suffices for all animals. We do not raise a different kind of corn for each animal. No, it is simply a matter of proportions. Cows, steers and horses will require larger quantities than hogs, and chickens still less. All animals need it for muscle, tissue, bone, and nerve development.

BOOK REVIEW

Diseases of Animals in Relation to Man —by Thomas W. M. Cameron, M.A., B.Sc., Ph.D., M.R.C.V.S., of the London (England) School of Hygiene and Tropical Medicine. This little work of 218 pages is more than comprehensive in its scope, it is complete. It is authoritative in every discussion save that of milk sickness. It is valuable to the veterinarian not only for its vast amount of useful and interesting material that is condensed into the 200 odd pages, but because of the testimony it bears to the large contributions the veterinary profession made to human health and happiness and to the protection the same profession now affords against disease and plagues that once took a toll of tens of thousands of human lives annually, but are now of rare occurrence.

The author has done an excellent service not only to the public, for whom this instructive volume is intended, but to the veterinary profession by placing information very much to its credit in the hands of the general public.

Faber and Gwyer, Ltd., 24 Russel Square, London, W. C. 1, London, England, are the publishers and the price is 3 s. 6d. Perhaps, including postage, about a dollar.

The farm chunk class of horses is composed of medium-sized, low-set, blocky horses, somewhat light in bone and often lacking in quality, but capable of performing all farm tasks of an ordinary nature at the walk or trot. Limitations for the class are: height, 15 hands to 15 hands 3 inches; weight, 1,200 to 1,400 lbs.

Loss of Pigs Due to Stomatitis

A. T. KINSLEY, Kansas City, Mo.

STOMATITIS is very common and is directly or indirectly responsible for extensive losses of pigs, particularly on farms where swine have been maintained in the same lots for several years. This disease is usually more prevalent when there is excessive rains and consequent insanitary pens and surroundings. It is also much more prevalent in pigs that are farrowed and maintained in insanitary pens and hog houses than it is in pigs that are farrowed and kept in clean quarters and sanitary surroundings. After the disease has once occurred in pigs on a given farm it is prone to recur in pigs farrowed on the same premises thereafter. The actual losses incident to stomatitis are difficult to estimate because the majority of swine breeders rarely report or record the loss of a little pig; however, it is known that the loss from this malady on some farms in certain years has been twenty-five per cent. of all the pigs farrowed.

Cause

There are many types of stomatitis according to pathologic classification, such as catarrhal, vesicular, phlegmonous, ulcerative and necrotic, and according to cause stomatitis may be classified as infective and non-infective. Non-infective stomatitis is usually caused by some mild irritant, such as hot slop and is not serious. Infectious stomatitis is caused directly by some microbian agent but predisposing influences are important factors in the occurrence of this type of disease. This condition probably occurs most frequently in pigs of large litters because they are likely to be undernourished and are prone to injure each other while attempting to nurse. Injuries or abrasions on the lips or buccal structures, due to fighting, harsh foods, etc., provide an avenue of entrance for various infecting microbes.

A variety of bacteria have been isolated from the lesions of stomatitis, any one of which may be capable of producing the disease. Thus pyogenic micrococci, streptococci, B. pyocyaneus, B. necrophorus and B. coli have all been incriminated. These micro-organisms are all practically universally distributed but probably none of them are capable of invading tissues that have not been previously injured. It is also probable that the pathogenicity of any of the microbian agents mentioned will be increased by a sojourn in injured tissues and the disease would have a tendency to become more severe in each succeeding case. When one pig in a litter becomes infected the infecting microbian agents are transferred to the sow's teat and other pigs become infected.

Symptoms

Stomatitis, at least the fatal type of this disease, occurs in the first few days after farrowing. Rather extensive lesions have been observed in one-day-old pigs, indicating infection at the time or immediately after farrowing. It may occur in pigs up to three weeks of age but is not common in pigs after they are ten days old.

Frequent attempts to nurse is one of the first symptoms noted. Affected pigs are listless, they have a tendency to remain quiet and are not active and playful as are healthy pigs. In a few hours or within a day or two there is marked depression, gauntness, and probably diarrhea. If an affected pig is caught and carefully examined lesions will be found that are responsible for the condition. Several or all the pigs in a litter usually

become affected with this disease although it may be confined to one pig.

Lesions

The lesions of stomatitis vary according to the infecting agent. The lesions are primarily confined to the lips, snout and any portion of the buccal mucosa or tongue. The successive changes in the affected tissue or tissues are: congestion, inflammation, suppuration and in the more severe cases necrosis. Hemorrhage may occur as a sequel of congestion or necrosis. The lesions are usually quite superficial but in severe cases the submucosa or subcutis may be involved. In some cases pustules may be noted. Diffuse suppuration may occur in which case the pus is usually of a grayish white color. Some cases have been observed in which there was marked infiltration of the surrounding tissues thus producing a marked swelling. Stomatitis produced by the B. pyocyaneus is usually characterized by an intense destructive inflammation and the formation of a green colored pus.

The lesion produced by the B. necrophorus is usually located at the margins of the gums. The successive changes in this lesion are as follows: congestion, tumefaction, increased sensitiveness. Two or three days later the affected area becomes yellowish white or even brown in color and of a mushy consistency, and later sloughs, leaving an eroded surface which is covered by coagulated necrotic debris that appears as a diphtheritic membrane. The surrounding tissue becomes red, tumefied and hypersensitive. These lesions extend and ultimately become confluent, forming large eroded areas. Similar lesions may occur on the lips, snout and cheeks.

Diagnosis

The diagnosis of stomatitis is not difficult provided the history, symptoms and lesions are given proper consideration. The different types may be identified thus: catarrhal stomatitis affects a large percentage of the exposed pigs simultaneously and practically the entire buccal mucosa will be affected. Stomatitis produced by infection is characterized by local circumscribed or diffuse lesions. Pyogenic micrococci and the B. pyocyaneus stomatitis are typified by white patches on the buccal mucosa. B. necrophorus stomatitis is characterized by a rapid course and destructive inflammation involving local areas of the mucosa of the mouth. A pungent disagreeable odor emanates from these lesions.

Prevention

Stomatitis in pigs primarily occurs in pigs that are maintained in pens and lots that are not sanitary, in pigs that are improperly fed, and in pigs in large litters. The condition can be prevented by providing sanitary quarters, proper nourishing feed and seeing to it that a sow does not mother more pigs than she has teats. Pigs in excess of the number of teats should be artificially fed or placed with another sow that can provide for them. It is not necessary to clip or remove so-called wolf teeth, black teeth or sharp teeth. In fact clipping or extracting teeth in small pigs always produces more or less injury to the mucosa of the gums thus providing an avenue of entrance for various microbes that are always present.

Treatment

By proper care and treatment it is possible to reduce the loss of little pigs from stomatitis to a minimum provided the treatment is begun in the early stages of the disease. When stomatitis has been identified on a farm each pig, particularly of the litters in which the disease has occurred, should be caught and carefully examined at least once daily. Affected pigs should be treated once daily. A successful method of treatment consists of removing all necrotic tissue by means of a curette after which tincture of iodin is applied. One or two such treatments is sufficient and the large percentage that recover will probably be surprising to those who have not attempted to relieve these cases.

OBSCURE DISEASE OF SWINE

I have noticed the reports of Dr. A. T. Kinsley in the October issue of Veterinary Medicine, regarding the possibility of swine becoming diseased from eating sweet clover. I have observed similar cases in swine that were not fed sweet clover and will relate the following from among many such cases I have encountered.

A shed and a lot were divided equally by a wire fence. In one lot corn was raised this year, and the other lay idle. Last winter eighteen cattle died in this lot in sixteen hours from peracute hemorrhagic septicemia.

The owner had 90 weaned pigs in another pasture and seventeen sows and two boars in another pasture, quite a distance from this shed and lots. These pigs were "dwindling up" as the farmer termed it, and one died. I made a postmortem examination and decided that the pigs needed vaccination with anti-hog-cholera serum and virus and swine plague bacterin, also that they should be wormed, all of which was done. These pigs did fine, except seventeen sick ones that were in bad shape, and they showed improvement. In thirty days I was compelled by my judgment to revaccinate these seventeen pigs using enteritis and swine plague bacterins alternately every 48 hours for three injections, thereby saving twelve head out of the seventeen.

Then all pigs were put in the feed lot (corn field), using half of the shed. A week later the sows and boars were turned in the other half of the dry lot.

In four days the owner found a sow dead and swollen badly in the cervical region and twelve animals visibly sick. I was called but did not hold autopsy on the dead sow, thinking the condition was malignant edema or septicemia. The other sick hogs were lying around in the shed with inappetence, respiration peculiar to fever, temperature 105° F. to 108° F., constipation, listlessness, stiff, high-arched back, tail held high with half curl, hind end carried in the position that sows assume when urinating, two head with blue bellies, hog cholera squeal.

All hogs were immunized the next day with serum and virus and enteritis bacterin. In about one week all large hogs were dead except one sow that was immunized three years ago and one boar that was immunized at this time, also one sow that we missed and she was very sick. In the fatal cases, all hogs died in convulsions and ten were swollen badly in the pectoral and cervical regions. The old cholera immune sow did not get it. The same serum and virus and bacterin were used on one sick and one healthy herd aside from this one and worked fine. The immune hogs across the fence have not as yet taken sick.

Was this malignant edema, hemorrhagic septicemia, anthrax, or poisoning? The hogs were fed corn and soy beans.

I believe that if practitioners had the time and money to own and use a microscope these hog problems could be solved. I don't believe there is anything but that can be explained and conquered if the necessary amount of time and work is devoted to it.

Hume, Mo. Thos. B. Tipton.

The influence of inbreeding on fertility has been demonstrated at Storrs Experiment Station. Inbred hens were mated with their own brothers one year, and only 40% of the eggs hatched. The following year, the same hens were mated with roosters of another family, and 80% of the eggs were fertile and hatched.

Recently isolated pathogenic bacteria, especially streptococci, tend to produce lesions in inoculated animals corresponding to the lesions in the animal from which they were isolated. This fact holds relatively true of acute and chronic diseases and is therefore of considerable diagnostic value.

Extract of liver from embryo pigs may be of value in the treatment of cancer.

Smoked goose breast is a delicacy in some portions of continental Europe.

Beller of the Veterinary Division of the Agricultural School of Hohenheim, Germany, reports in a German veterinary weekly of finding an endless variety of bacteria in cases of abortion, retained placenta, and sterility as well as in normal births but no B. abortus Bang. He is a member of the Imperial Health Board of Berlin corresponding to our Bureau of Animal Industry.

If the practice of buying and selling animals with no concern as to their origin or breeding health continues as in the past many more millions are going to be lost by breeders. I have as little love for the dealer in breeding stock who buys and sells blindly as I do for the man who would sell tubercular animals. One is as responsible as the other and should be restrained.—Comstock in Animal Pathology Exch., Univ. of Ill.

Certain chemical agents have a therapeutic action in some bacterial infections, according to Walker and Sweeney. In some instances the action is almost specific; thus, gentian violet is effective only in staphylococcus infections; mercurochrome is of value in streptococcus infections; and acriflavine is more effective in staphylococcus infections providing it is brought in direct contact with the microbes.

Iodin found in marine plants is more effective than inorganic iodids in the treatment of thyroid defects. The iodin in marine plants is probably in a colloidal form and is therefore slowly absorbed from the digestive tract. The slow absorption of iodin from marine plants accounts for its being nontoxic.

Paralysis of chickens of unknown origin has been identified in various locations in the United States. According to preliminary investigations, this paralysis is not due to deficiency in vitamins or other essential food elements, neither is it due to unsanitary surroundings or parasitism. This is not only an interesting but important problem for poultry experts.

Carbon monoxid poisoning due to inhalation of automobile exhaust fumes on streets of cities is one of the health problems that should receive consideration. This condition particularly concerns traffic officers that are obliged to be in the traffic continuously for several hours as the monoxid poisoning is cumulative.

Extensive hemorrhage would be practically universally fatal if it were not for the protective mechanisms, viz., inflow of tissue juices, regulation of the percentage of salt by the kidneys, and increased permeability of the capillary walls, that are available during such emergencies.

Young growing pigs should be provided a a ration that contains some iron. Whether iron in the form of copperas should be added to the ration will depend upon the iron content of the feed provided. A slight excess of iron is not injurious.

Should we not distrust all over-elaboration of method, whether of obtaining or of treating data, whether of apparatus or mathematics or statistics? Howsoever inevitable such development is, should we not be actively on guard lest it lead us and particularly our youth inward to mooning over artificialities instead of out to live with the stubborn facts of a real world? If I knew a young fellow who sought advice about love, I should not send him to his room to study Balzac's "Physiologie du Mariage" or Bourget's more ponderous "Physiologie de l'Amour moderne," nor yet to a clinic to be "psyched" a la Freud; I should tell him to go see some girls.—Edwin B. Wilson, Harvard University, in "Science."

Abortion in ewes due to feeding on sorghum hay has been reported. In the cases observed, the cane had been sown broadcast and cut with a binder. There was some seed, but the fodder was of good quality. Veterinary Medicine will be glad to have further reports and discussion of abortion in sheep due to sorghum fodder.

In a relatively large percentage of cases of endocarditis in the human, a streptococcus can be isolated from the blood, and usually also from the vegetations on the heart valves on autopsy. This is indicative of streptococci as an etiologic factor of endocarditis, at least in man.

HOG CHOLERA CONTROL

Dr. Charles Keane, associate chief of the division of animal industry of California, is quoted in the San Diego Tribune as giving the following advice to hog owners of that state:

"Observers have noted that waves of hog cholera sweep over this country at more or less definite intervals, and a peculiar feature in connection therewith is the fact that the movement is always westward. In former outbreaks California always was invaded, our swine being the last to suffer. Now is the time, therefore, for our swine raisers to take time by the forelock and utilize every facility available for the protection of their herds. The principal means of protection is, of course, vaccination properly performed, and with the great shortage of swine here and elsewhere in this country no time should be lost in doing this. I would sound a note of warning, however, and that is vaccination is worse than worthless unless properly performed. For this reason I would advise those who are not thoroughly familiar with the operation and its pitfalls to consult with the state department of agriculture, University of California, or a competent, experienced veterinarian before attempting to immunize their herds."

Abortion disease due to the B abortus Bang continues to exact a heavy toll. No doubt the losses from this malady will be reduced in the not far distant future, for according to some investigators and sanitarians, the living culture abortion vaccine reduces the losses incident to abortion in infected herds, and fortunately the use of the living culture vaccine does not retard conception, increase sterility, nor increase the number of animals that eliminate the B. abortus Bang.

WHITE SNAKEROOT

The writer has had a number of letters like the following, in regard to white snakeroot, which seems to be causing a great deal of trouble in parts of Illinois and Iowa:

"If you have a bulletin on white snakeroot poisoning in cattle, please send me a copy, also as it affects other domestic animals. If you have no bulletin, would you please be so kind as to give me a botanical description of the white snakeroot. Also the pathology of cattle poisoned by such plants, with the symptoms and treatment. I am a graduate of the McKillip Veterinary College, class of 1915. I believe I have had a few cases of snakeroot poisoning but am not sure; can't find much in the textbooks."

White snakeroot is known to botanists as Eupatorium urticaefolium. It is a smooth branching perennial with broadly ovate, pointed, closely and sharply toothed long petioled leaves. The flowers are white in compound corymbs and heads.

In the November number of Veterinary Medicine, there is an account of trembles and milk sickness caused by this plant, and there is no need at this time to republish the symptoms of the disease, but it would be well for the readers of Veterinary Medicine, or those who may be interested in trembles and milk sickness, to get a copy of the bulletin on this subject issued by the Pathological Division of the Bureau of Animal Industry, Washington, D. C.

Mr. C. T. Hilmers, florist, of DeWitt, Iowa, writes as follows:

"I have been interested in an article from the University of Illinois, in which the white snakeroot, which has caused the death of people and livestock in that state, is identified as Eupatorium ageroides, or more properly E. urticaefolium. I am surrounded by pastures and am growing E. purpureum and E. lasseauxii outside and E. grandiflorum (atrorubens) in the greenhouse. Are any of the foregoing Eupatoriums poisonous? Since Bailey gives E. urticaefolium as native of eastern

North America, this menace cannot be easily controlled, but it seems to me it could be checked through education, that is, if this plant carries a poison as virulent as is evident from the article. Are there any other plants commonly cultivated which are dangerous?"

The only danger from white snakeroot is in fodder and forage, and indirectly to human beings where the milk is consumed from cows that have eaten the white snakeroot. So far as I know, none of the other Eupatoriums mentioned are injurious. Certainly the white snakeroot is not poisonous to touch. He asks whether any other plants commonly cultivated are poisonous. So far as I know, none are, excepting occasionally the irritating qualities of certain species of Primula, like P. obcocina. I think the matter of the injuriousness of white snakeroot is probably put a little bit strongly.

Ames, Iowa. L. H. Pammel.

RESEARCH ON SURGICAL SUPPLIES

According to Dr. E. R. Weidlein, Director, Mellon Institute of Industrial Research, University of Pittsburgh, the firm of Johnson & Johnson, manufacturer of surgical supplies, New Brunswick, N. J., has established at the Institute a Fellowship that will study the exact requirements of surgeons and other medical specialists in the way of sundries, with the joint aim of developing new supplies that are needed and of standardizing the products now in use. An investigation will also be made of the processes of renovating used supplies, and several other Industrial Fellowships of the Institute will coöperate in devising satisfactory procedures.

Dr. Frederic H. Slayton (M.D., Rush Medical College) will be in direct charge of this comprehensive research. The Fellowship will be operated in a totally unbiased and independent manner, in accordance with the Mellon Institute system, and all its investigations will be conducted primarily for the benefit of the public. It is the plan to report the results in appropriate periodicals.

Dr. Slayton and the Institute's Executive Staff invite the concurrence of all interested organizations.

FEW VETERINARY GRADUATES IN 1926

Only one hundred and thirteen men graduated and received veterinary degrees in 1926, from all the veterinary colleges in North America. Just a few years ago a larger number were graduated each year from a number of different colleges. During and just after the World War all the private colleges closed, leaving ten state institutions with a Veterinary Department. Of these in 1926, the Iowa State Agricultural College graduated 15; Colorado State Agricultural College, 11; Ohio State Agricultural College, 20; University of Pennsylvania, 10; Texas A. & M. College, 3; University of Ontario, 12; Michigan State College, 11; Cornell University, 19; and Kansas State Agricultural College, 8. The majority of these recent veterinary graduates have accepted positions of different kinds, such as teaching, laboratory work, etc., and only a few have entered veterinary practice. So far as we can learn three of these recent graduates have located in the state of Illinois, to engage in practice, and one in Missouri. On the other hand a large number of men who were engaged in practice have given it up to follow some other occupation. A large number of veterinarians now in practice are looking for some other opening, and would quit immediately if other profitable employment could be found. In short the number of veterinarians in actual practice is gradually and quite rapidly decreasing. Some of the older men are retiring. The younger and middle-aged men are taking up sidelines or looking for a complete change to some other occupations. Few are joining the ranks. In a comparatively few years competent veterinarians are apt to be scarce.—Columbia (Mo.) Farmer.

Chronic Endometritis

By J. F. DE VINE, Goshen, N. Y.

THE term chronic endometritis, as with acute endometritis, if we limit the term to changes occurring in the endometrium only, would be entirely too restricted to be practical clinically, since the condition is probably usually more or less complicated with chronic metritis.

We might profit by the opinion of gynecologists who hold that in the human family a noticeably large percentage of cases of chronic endometritis have a history of previous abortion, but that the endometrium seems to be peculiarly immune to what might be termed a permanent infection of gonorrhea. This would appear to substantiate what we have stated in discussing the cause of acute endometritis and its similarity to gonococcus infection in the human family. Likewise the lack of permanency of gonorrheal infection in the human family is in harmony with the findings of Schroeder and Cotton: "That the Bang organism is not recoverable in the uterus but for a short period after it ceases to be gravid," notwithstanding that structural changes of the endometrium may and do take place that are observable for a variable period.

It is my opinion that chronic metritis probably can truly be said to be a postpartum condition, at least I have never found a condition in a heifer that has never conceived that I could diagnose as chronic endometritis. While admitting that this point is debatable, it would appear that as in the case of transitory gonococcus infection in the human family we might also have a transitory infection of the endometrium of the non-gravid uterus by abortion organisms, but conception and abortion seem necessary prerequisites for the establishment of chronic endometritis, and that it occurs only after an abortion or at the end of an apparently normal gestation that is followed by a distinct inflammation which does not entirely subside, but rather becomes chronic, in many cases retarding indefinitely the normal involution of the uterus. The nature and duration may vary from so mild a form as to be scarcely determinable clinically, to a form so extensive as to involve more or less of the muscular walls and is manifest by slight secretions, particularly at the time of estrum, and a feeling of increased density or flabbiness of the uterine horn or horns, detectable on palpation. This information often proves valuable when examining heifers, the breeding history of which indicates them as not having conceived and as having irregular periods of estrum. The veterinarian not infrequently is able to inform the attendant that the heifer in question that is said to have never conceived, has already conceived and aborted, basing his diagnosis on the presence of chronic endometritis. We have proved to our satisfaction by later acquiring a more definite history of some cases that such a diagnosis is entirely permissible and reasonably reliable.

Workers do not seem to be agreed as to the role chronic endometritis plays in sterility, its frequency and its treatment, some believing that it is one of the frequent and potent causes of sterility and that it is rather easily diagnosed by fixing the cervix with forceps and carrying it back into the opening of the vulva so that the cervix and endocervix are examined; that in chronic endometritis the cervix is usually plainly affected, showing increase in size and that the normal pink mucosa suffers an inflammatory injection in a varying degree and exhibits an abnormal hypersecretion. Others are of the opinion that these symptoms are not always plain and detectable and that ordinarily we do not get reliable information regarding endometritis by rectal examination, since the normal uterus varies greatly

in size, form and thickness, as well as in the physiological changes occurring in its size and tension caused by ovulation.

It is my opinion that both of these views have merit but that both are carried to the extreme. I do not consider simple chronic endometritis nearly as common a cause of sterility as some other pathological conditions, and further when it is present if not complicated or too severe, it yields more readily to such mild treatment as massaging than do some of the other morbid changes. I believe that most of the cases are susceptible to diagnosis by the trained fingers, by palpation; but that not all cases can be diagnosed positively either by palpation or by fixing the cervix with forceps and carrying it back into the opening of the vulva. The cases that so pronouncedly involve the cervix should, in my judgment, be classified under cervicitis.

The importance of training the sense of touch to aid in diagnosis of chronic endometritis and tubular trouble becomes at once apparent when we have had sufficient evidence in the herd and on the killing floor, of the distinct asymetry in the size and density of the normal uterine horns of different cows; age, number of pregnancies, etc., causing a wide variation as well as the marked temporary changes occasioned in the uterus by the congestion of estrum. A point that writers seem to have neglected to place emphasis on, and which is of much importance, is that with abortion, as in most microbian diseases, the virulence and extent with which it appears in a herd, has an important bearing on the structural changes that will occur in the generative organs and the resultant disasters left in its wake.

My experience has been that in herds where many cows have aborted irrespective of age, physical condition or period of pregnancy, the changes in the generative organs have been wider in range and more severe in character, than where the percentage of aborters was lower.

It is in these herds where acute cotolyedonitis and endometritis exist in a severe form, and that chronic endometritis most frequently, if neglected, prevents subsequent satisfactory implantation, constituting sterility or imperfect implantation to later constitute abortion.

Diagnosis

For clinical purposes the simplest method for differentiating is to style as chronic endometritis, those cases where there is sufficient thickening of the fundus or horns to indicate that an inflammatory condition exists, which may be manifest either by a flabby organ without tone, or conversely, by one that is noticeably too rigid. The absence of any exudate, with the possible exception of a slight exudate during the period of estrum, coupled usually with an enlarged and firm cervix, serve to indicate chronic endometritis. As previously stated when the cervical changes are more pronounced than the endometritis it is then best classified as chronic cervicitis involving the endometrium. Its differentiation from chronic metritis rests principally on the absence of severe uterine changes and purulent exudate.

Chronic endometritis, as with other chronic inflammatory conditions, originates from a more or less acute septic inflammation of the uterus, or from a mild persistent irritation, and is apt to be accompanied by more or less pathological change in the ovaries and tubes since it serves as a passage way for these infections to travel from the endocervix forward.

Some workers believe that irrigating the uterus is the necessary treatment for the relief of chronic endometritis; others believe that massaging the organ and correcting the pathological condition of the tubes and ovaries, that so frequently exists with chronic endometritis, is the logical way to relieve it.

While there is no question but that irrigating the uterus and mechanical cleansing with a saline solution are of advantage and in some cases necessary for the relief of this condition, I am nevertheless quite convinced from experience that crushing cysts, removing false corpora lutei, massaging the ovaries and uterus are of positive value in toning up the uterus, thereby enabling it to throw off

inflammatory exudates by stimulating the normal germicidal secretions and hasten its physiological return, and I resort to irrigation only in those cases that do not yield to massage, the per cent. of which is small.

In treating chronic endometritis as is the case with chronic cervicitis; metritis mixed bacterins are of positive advantage in every case, and in some cases so specific as to be patent to any fair minded person.

We frequently meet cases if it were not for bacterins I question if it would be feasible to treat them, for instance, pronounced chronic cases where it is not practicable to see and treat them often, cases like the following:

A splendid type, six year old Guernsey cow was brought into a heard that I visit with the local veterinarian about once every three months. This animal was bought with the history that she had calved about a year and a half before, had been bred repeatedly; her heat periods being very irregular during the past nine months. Sometimes going two or three months without showing any evidence of estrum.

Examination revealed a violent cervicitis, chronic endometritis and probably chronic metritis, ovaries enlarged and cystic. The cervix was wide open so that the hand could be passed in; the horns were about the size of a man's forearm (approximately 12" in circumference about midway of the horn). The weight was sufficient to carry the uterus well down against the abdominal viscera, so far forward and so heavy that only one with a long, strong arm and accustomed to manipulating these organs could raise it and tip it over into the pelvic cavity. We did this, gave the uterus a good irrigating with hot water and an alkaline douching powder, massaged all of this out; swabbed the cervix thoroughly with tincture of iodin and gave 6 cc. of metritis mixed bacterins.

The local veterinarian was to see that the cervix was douched every day with a hot alkaline solution (112° F.) and the uterus and ovaries massaged every five or six days, until the ovaries seemed fairly normal; the massaging of the uterus to be continued over a long period. The dose of bacterins was to be increased from six to eight cc. and then to 10. The 10 cc. dose to be continued every 10 days until such time as it seemed advisable to discontinue.

The douching and giving of bacterins was carried out; but the local veterinarian, having suffered infection of one hand, was not able to raise the uterus and after several attempts finally gave it up and so advised me. I saw the animal again in about three weeks. The ovaries were much improved in size and in texture, but there was no perceptible improvement in the cervix or uterus. However, the douching of the cervix and the giving of bacterins were continued. The animal was examined again in about two months. The improvement was so pronounced that every one felt that the case now seemed quite hopeful. The uterus had become so much smaller and lighter that my colleague could easily massage it. The cervix was so nearly closed as to scarcely admit the index finger, the animal had had two heat periods. The second, eighteen days after the first. The treatment was continued excepting that the ovaries were to receive no further attention, another heat period followed in twenty-one days. An examination made about six weeks later found the condition of the organs such as to warrant a trial breeding; accordingly the animal was bred the next heat period. Douching and bacterins continued; another heat period occurred twenty-two days later, animal bred again. As estrum periods then ceased, treatment was discontinued. Three months later found the animal pregnant in left horn.

This is rather typical of several cases that have come under our observation and we feel thoroughly convinced that were it not for the aid of bacterins in such cases it would usually be advisable to send the animals to slaughter.

Brucella abortus isolated from the human have proved highly virulent for guinea pigs and pregnant heifers. In fact, according to Carpenter of Cornell, cultures of Brucella abortus isolated from the human produced abortion in a shorter time than strains from the bovine.

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Veterinarians Can Make Test for Infectious Abortion in the Field*

VETERINARIANS can make the agglutination test for infectious abortion in cattle and swine in the field with a considerable degree of accuracy.

This is accomplished by taking a small test tube, 4½ inches long and ½ inch in diameter, containing a suspension of the Bacillus abortus in a special dilutent. Such a solution can be prepared by any laboratory.

A drop of blood, from the suspected animal, is secured by puncturing the ear vein with a needle. The drop of blood, about the size of a match head, is collected on a wire loop which is fastened in the cork of the tube. The loop containing the blood is then inserted into a tube, corked and shaken vigorously to completely mix the blood and suspension. About 5 c.c. of the suspension and one drop of blood will give a dilution of 1-100. The tube is then allowed to stand in a warm place for 24 to 48 hours. At the end of this time if the solid contents of the tube have fallen to the bottom, leaving the solution above water clear, the animal may be regarded as infected with infectious abortion organisms. If the solution remains cloudy, the test must be regarded as doubtful or negative. A further test may be made at a later date.

The test is not infallible, but it is a good test to use under field conditions. In important cases, field tests may be confirmed by sending specimens of blood or serum to a diagnostic laboratory. A simple test of this kind can be used by the veterinarians in the field to test suspected animals without much delay and with a good degree of accuracy. In many instances this will allow immediate steps to be taken for the prevention and control of infectious abortion.

Lincoln, Nebr. L. V. Skidmore.

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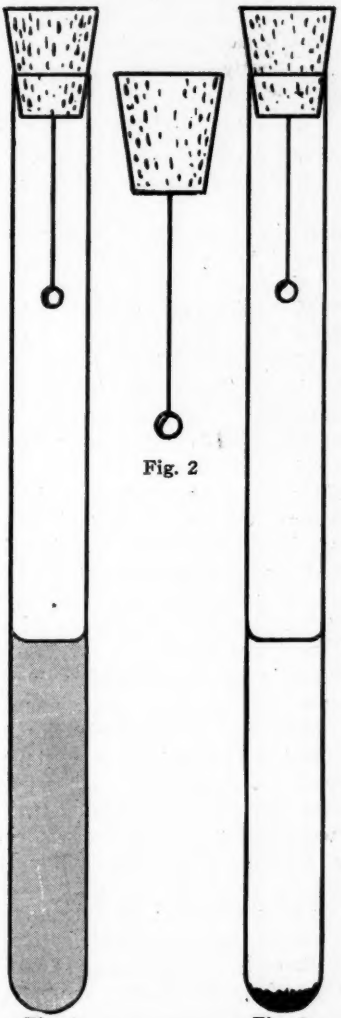


Fig. 2

Fig. 1 Fig. 3

Fig. 1—Solution cloudy in test tube; negative test.
Fig. 2—Cork with wire loop to collect blood.
Fig. 3—Solid contents at bottom of tubes, solution above clear; positive test.

Parasites in Central American Tropics

Parasites in Central American Tropics

UNEXPECTED findings concerning animal parasites in Central American countries are reported by Dr. Maurice C. Hall, chief of the Zoological Division, Bureau of Animal Industry, who returned September 15 from a research expedition in the tropics. In representing the United States Department of Agriculture, Doctor Hall made a survey of the animal-parasite situation in Panama, Nicaragua, and Salvador. The expedition was organized by and directed by the Johns Hopkins School of Hygiene and Public Health and conducted under the auspices of the International Health Board of the Rockefeller Foundation. The staff included also Doctors Cort, Stoll, Sweet, Riley, Augustine and Brown. Doctor Cort was the director.

Besides gathering extensive information concerning parasites and parasitic diseases in the countries mentioned, the scientists brought back about 150 bottles of prevailing parasites, some of them apparently new and of economic and scientific importance.

"The trip has furnished a valuable background of tropical conditions as regards factors in parasitic development," says Doctor Hall. "In the extent and nature of diseases of livestock caused by parasites in the countries visited, the findings were unexpected and reassuring in many respects. The range cattle of those countries proved to be practically free from gastro-intestinal parasites, and in many cases appeared to be entirely so. While there is an abundance of moisture and warmth in the tropics, things which themselves are favorable to parasites, the seasonal distribution of rain is highly unfavorable to parasite eggs and larvae.

"In the countries visited—Panama, Nicaragua, Salvador and Guatemala—there are from two to six months, as a rule, and more in exceptional seasons such as this year, when there is no rain whatever. In the absence of moisture the hot tropical sun has a desiccating effect which is fatal to parasite eggs and larvae and which must have a decided sterilizing action on bacteria.

"Furthermore, the rains themselves are torrential and in the mountainous countries must have a washing effect which serves to sweep worm eggs and larvae into the many water courses and out of contact with livestock. Finally, there is little overstocking on these ranges and a resulting lack of concentrated infection."

One important object of the expedition was to determine what tropical diseases are likely to be carried northward by shipments of livestock. The survey has given a satisfactory answer to that question.

Cattle in the countries visited suffer from ticks and tick fever. Tuberculosis appears to be rare among the range cattle; the bacterial diseases of importance were anthrax, blackleg, and tetanus. In contrast to the relative freedom of range livestock from parasites, household animals in the countries visited showed fairly extensive infestation. Swine especially suffer from kidney worms which cause considerable loss of meat and lard. Another common swine parasite causes the disease known as swine measles or cysticercosis, due to bladderworms in the meat. These bladderworms are the larval stages of a large and dangerous human tapeworm.

The results of the expedition show that in shipping livestock from Central America to the United States the only diseases of livestock that appear to warrant serious consideration are tick fever, anthrax, blackleg, and tetanus, though final con-

clusions depend on the identification of the parasites collected and also on further studies in Central America. Doctor Hall made his examinations of animal parasites largely at local abattoirs in collaboration with Doctor Augustine.

Revolutions in Nicaragua in May and August interfered considerably with the project on the study of drugs for the removal of worms in which the International Health Board was especially interested and in which Doctor Hall also collaborated. The most interesting development of this work was the discovery that almost 40 per cent. of the soldiers examined and treated by the scientists were infected by one of the dog and cat hookworms not known to be present in man in Central America. The new findings are an important aid to public-health work in the regions visited. The scientists collaborating in this project were Dr. D. L. Augustine, Dr. D. M. Malloy, Don Bernabe Rosales, and Doctor Hall.

The trip resulted also in numerous other findings of a specialized and highly technical character, including the efficacy of several new drugs.

Prescriptions for Mange in Dogs

Dr. Maurice C. Hall, noted parasitologist and Chief of the Zoological Division of the U. S. Bureau of Animal Industry, recommends the following applications for the treatment of ear mange, sarcoptic mange and demodectic mange in dogs:

For Ear Mange

No. 1: Carbolic acid 1
Glycerin 99
M. et f. sol.
Sig. Swab the external auditory canal daily.

No. 2: Creosote 1
Glycerin 99
Directions: same as for No. 1.

No. 3: Carbolic acid 5
Castor oil 95
Directions: same as for No. 1.

No. 4: Creosote 5
Castor oil 95
Directions: same as for No. 1.

No. 5: Carbon tetrachlorid 25
Castor oil 75
Directions: same as for No. 1.

No. 6: Chloroform 10
Castor oil 90
Directions: same as for No. 1.

For Sarcoptic Mange

No. 1: Oil of tar 20
Green soap 20
Alcohol 60
Sig. Apply to one-fourth of the body daily on each of four successive days. Allow to remain four days on each quarter and then wash off with soap and warm water, and repeat after four days. Prevent the animal from licking itself.

No. 2: Oil of tar 13
Crude petroleum oil 12
Liquid petrolatum 75
Directions: same as for No. 1.

No. 3: Oil of tar 9
Potassium carbonate 8
Sublimed sulphur 17
Lard 66
Directions: same as for No. 1.

For Demodectic Mange

No. 1: Thymol 4
Chloroform 24
Olive oil 72
M. Sig. Apply daily.

No. 2: Carbolic acid 4.5
Oil of tar 4.5
Sulphur flowers 19
Kerosene 36
Raw linseed oil 36
M. Sig. Apply with mild rubbing once a week.

A Study of Hernia in Swine

By B. L. WARWICK, Madison, Wis.

RESEARCH BULLETIN 69, of the Agricultural Experiment Station of the University of Wisconsin gives an interesting record of the author's research into the problem of hernia in swine, the importance of which justified more attention than has heretofore been given to it.

The discussion is too extensive to reproduce in these pages in toto. The following excerpted paragraphs will, however, prove instructive.

The kinds of hernias commonly found in swine are: (1) inguinal, in which the inguinal canal serves as the hernial ring; (2) scrotal, in which the scrotum is the hernial sac; (3) ventral, in which the hernial ring is located in the lower part of the abdomen; (4) umbilical or navel, in which the umbilical or navel opening is the hernial ring.

The purpose of this investigation is an attempt to determine: (1) the economic importance of hernias; (2) the physical basis for their causes; (3) whether there are genetic factors for hernias and if so the mode of their transmission; and (4) breeding tests and procedures for the elimination of hernias from breeding herds of swine.

Economic Importance.—In an attempt to ascertain the proportion of the swine crop affected with hernias in 1923 and 1924, the writer sent questionnaires to all of the Agricultural Experiment Stations in the United States. Twenty-nine reported for 1923 and nineteen reported for 1924.

It seems logical to assume that the percentages arrived at are at least as low as those for average farm herds of the country. This table shows that a little over one and one-half percent of the male pigs raised were affected with scrotal hernias and about one-half of one per cent with umbilical or navel hernias. Approximately one per cent of the females were affected with hernias, all but three individuals of which had umbilical hernias. One and three-fourths per cent of the total number of swine raised were affected with hernias.

The total number of swine in the United States is given as 61,982,798 in a table on page 587 of the 1920 Census. Of these, 12,341,811 were breeding stock six months old and over. Deducting the breeding stock leaves 49,642,987 head as the probable number raised during the year. Using the total percentage arrived at for the experiment stations, we estimate that 858,823 head were affected with hernias. Assuming that the sexes are equally distributed, we have the figure 24,821,493 as the number of males raised. One and sixty-eight one hundredths per cent of these quals 417,001 head. A conservative estimate of the loss per head is $1.00, which results in $417,001 per year loss.

It should be noted that umbilical hernia has appeared in only one individual of the three generations of selection for inguinal hernia. This is only 0.34 per cent as compared to 1.39 per cent in the herd from which the parents were selected, and 0.83 per cent in the other Experiment Station herds reported. This shows that selection for inguinal hernia has not raised the incidence of umbilical hernia. Not enough critical data have been accumulated yet to show whether umbilical hernia is heritable or not, but such evidence as is at hand seems to indicate that it is largely, if not entirely, independent of inguinal hernia in its incidence.

Practical Considerations

1. Never use for breeding purposes a boar which is or ever has been afflicted with inguinal hernia. This includes animals in which the hernia has disappeared naturally, as well as those in which it has been reduced by operation. Whether hernias would appear among the immediate offspring of any such boar would depend upon the heredi-

tary makeup of the females with which he was mated. In any case all of his offspring would carry some of the factors responsible for inguinal hernia. This would make it very probable that hernia would reappear in later generations whenever individuals of certain genotypes, even though themselves normal, happened to be mated together.

2. Discard any normal boar which has sired one or more herniated pigs. Such a boar will transmit factors for hernia to more than half his offspring and hence tend to carry it on in the herd, even though the sows to which he is mated should be entirely free from the taint.

3. Do not select breeding stock from sows which have produced one or more inguinally herniated pigs. The same reasons apply here as in the case of the male.

4. Do not retain for breeding purposes littermates to inguinally herniated boars, especially the males. Some of these will probably be free from the hernia factors, but it would require extensive breeding tests to determine which ones these are.

5. Elimination of all of the progeny of boars which have been known to sire inguinally herniated pigs would also be advised. Probably, in many cases, this would not be practical.

The rules which have been suggested provide a logical method of reducing and in time of entirely eliminating inguinal hernia from a herd of swine. It may be more drastic than would be practical in some cases, especially as there is always danger of reintroducing the defect whenever new animals from outside are brought in. Since the boar is the parent of many more offspring than any one sow, his influence on the breeding of the herd is far greater than that of any individual female. Such being the case, it is especially important to take care in his selection, especially as indicated in paragraphs one and two.

Summary and Conclusions

1.—Hernias commonly occurring in swine are inguinal (including scrotal) and umbilical. In the Experiment Station herds from which records were obtained, inguinal hernia affected 1.68 per cent and umbilical hernia affected 0.60 per cent of the male pigs raised to weaning. Practically all of the hernias of female pigs were umbilical. The total per cent of herniated females was 1.16.

2.—The physical causes of inguinal hernias probably are (a) large internal vaginal rings, and (b) low degrees of tensity of the tunica vaginalis. The size of the internal opening of the inguinal canal is not the physical factor responsible. This opening is triangular in shape and is always large enough in the young pig to permit herniation.

3.—Study of fetuses of known ages showed that the testicles reach the subcutaneous canals external to the external inguinal rings between the 80th and the 90th days. At 100 days and later, the testicles are situated in the scrotum. This allows 12 to 18 days of fetal life after the testicles have passed through the abdominal wall for the newly formed tunica vaginalis to attain strength enough to withstand the abdominal pressure after birth.

4.—The inguinal canal does not contract after the descent of the testicle. However, it increases relatively slowly in size, as compared with other parts, and particularly with the testicle. As a consequence, by the time of birth the testicle is too large to be withdrawn through the inguinal canal. The communication between the peritoneal cavity and the space between the layers of the tunica vaginalis in the scrotum nevertheless remains open.

5.—Inguinal hernia occurs more frequently on the left side than on the right. Unilateral cryptorchidism of swine also occurs more often on the left side. Inguinal hernia occasionally disappears spontaneously, even after several months duration. Cases of as long standing as that still have very large inguinal canals. Other cases, of a few days to weeks, may disappear and not be detected even at castration. Inguinal hernias first appear when the pig is from one day to about one month of age.

6.—Three generations of selection for hernia have been made. The parent stock included only herniated males, while the females were selected, so far as possible, for

DEC 30 1920

relationship to herniated boars. The herd from which the parents were selected showed 7.49 per cent of the male pigs herniated in the spring farrowing season immediately preceding the selection, and 4.19 per cent during three years of observation. The first generation of breeding for hernia resulted in 14.28 per cent of the male pigs being herniated. The second generation had 42.0 per cent of the males herniated. The third generation had 43.18 per cent of the males herniated.

7.—The results so far obtained appear to establish definitely the heritable character of inguinal hernia. The part which environment may play in its expression is not certain, but is presumably minor. A two-factor hypothesis has been tentatively advanced to account for the mode of inheritance of inguinal hernia. According to this hypothesis herniated boars result from the double-recessive genetype (*hhh'h'*), while females of the same constitution are normal.

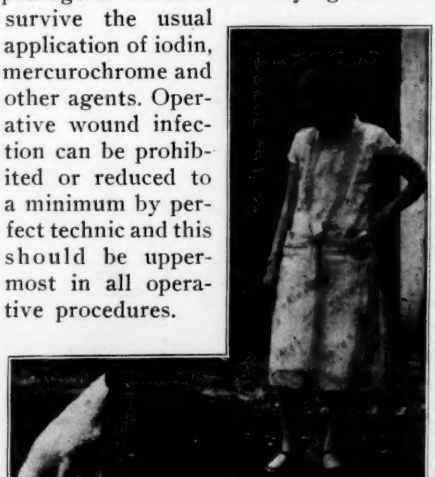
CARBON-DISULPHID FOR BOT-FLIES IN HORSES

Almost everyone having anything to do with horses is familiar with botflies and the annoyance they cause. Few horsemen realize, however, the injurious effects of the bot or maggot stage.

Investigations conducted a number of years ago in Italy showed that bots within horses could be destroyed by administering carbon-disulphid capsules. This treatment has been tested by the United States Department of Agriculture and found to be very effective. Carbon-disulphid will remove many bots at any time of the year, but the greatest efficiency can be obtained in winter months, preferably December or January. Early winter treatment is advisable, because horses freed from the parasites early will pass the winter in better condition.

In the last few years a number of communities have attempted bot control by systematic treatment of all donkeys, mules, horses, and colts. Results have been encouraging. Not only has the annoyance from nose botflies and other botflies been greatly decreased after a single year's effort but a general improvement has been reported in the condition and health of the horses. It appears entirely feasible, especially in regions where there are very few horses on pasture, to eradicate horse bots by a combination of the carbon-disulphid treatment and the application of washes for the destruction of the eggs. Every horse should be washed with a 2 per cent. coal-tar creosote dip to destroy the young bots which remain dormant in the eggs. Thorough treatment of all animals in a community should be very profitable if continued two or three years. Reinfestation is not liable to occur except where untreated animals are brought in, as it is believed the flies do not travel more than a half mile.

Prevention of infection of skin operative wounds by the use of antiseptics is problematic. Cultural tests indicate that pathogenic bacteria in varying numbers survive the usual application of iodin, mercurochrome and other agents. Operative wound infection can be prohibited or reduced to a minimum by perfect technic and this should be uppermost in all operative procedures.



Miss Carlas and Teddy, a Fillipino girl and her pet. This dog has just recovered from severe wounds, the result of an encounter with another dog. The Fillipino women are very fond of pets and, like their American sisters, over feed them as the picture shows. Dr. L. M. Yutuc of Manilla was the photographer.